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THE LANCET

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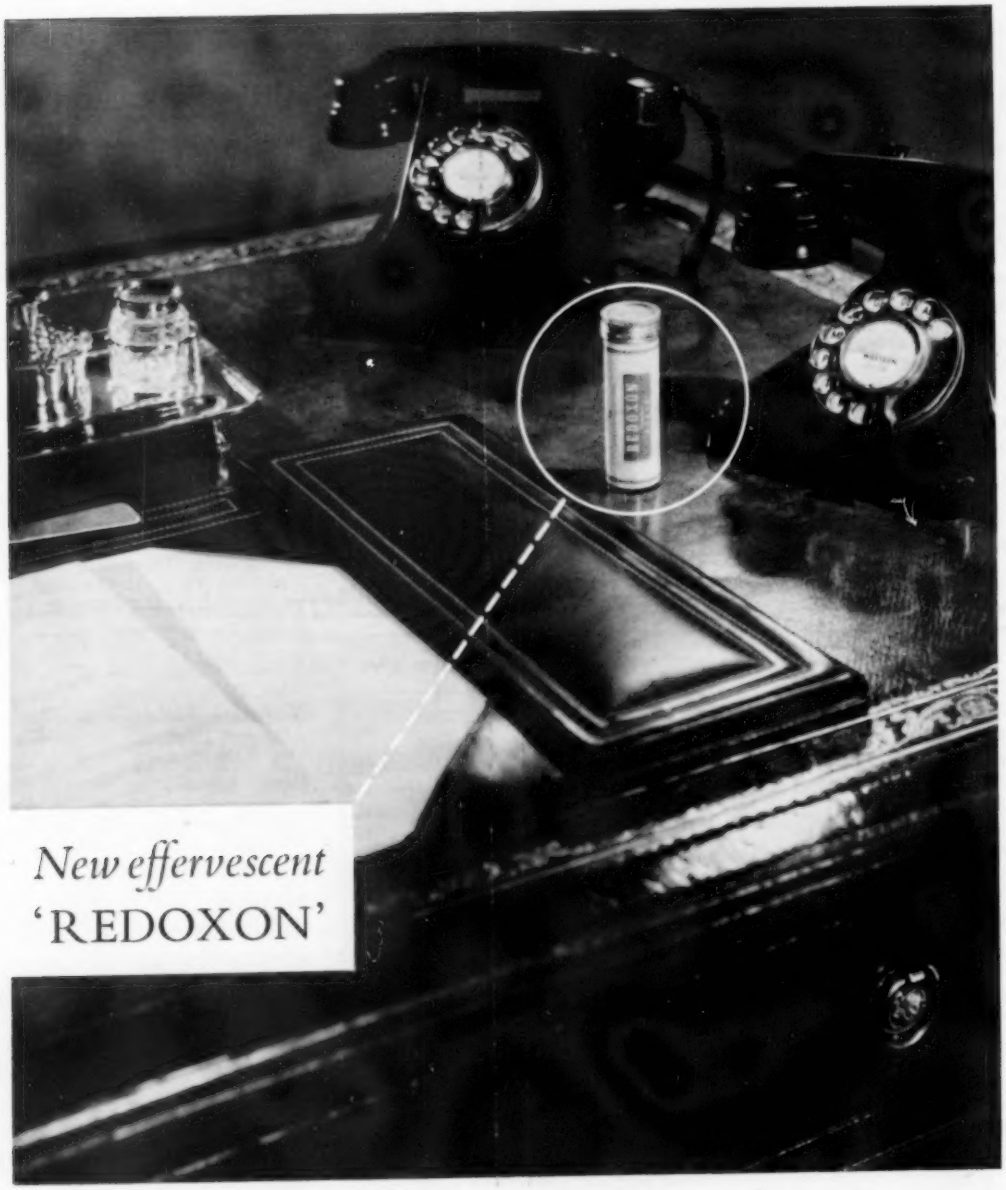

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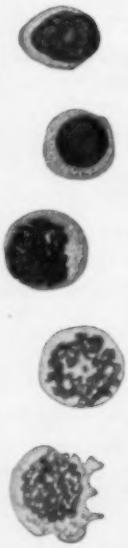

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1. *Nature*, 1955, *175*, 388.
2. *B.M.J.*, 1956, *1*, 142.
3. *B.M.J.*, 1955, *1*, 1367.
4. Annotation (1956), *B.M.J.*, *1*, 161.
5. *Schweizerische Medizinische Wochenschrift*, 1956, *38*, 1100.
6. *Practitioner*, 1957, *179*, 1071.

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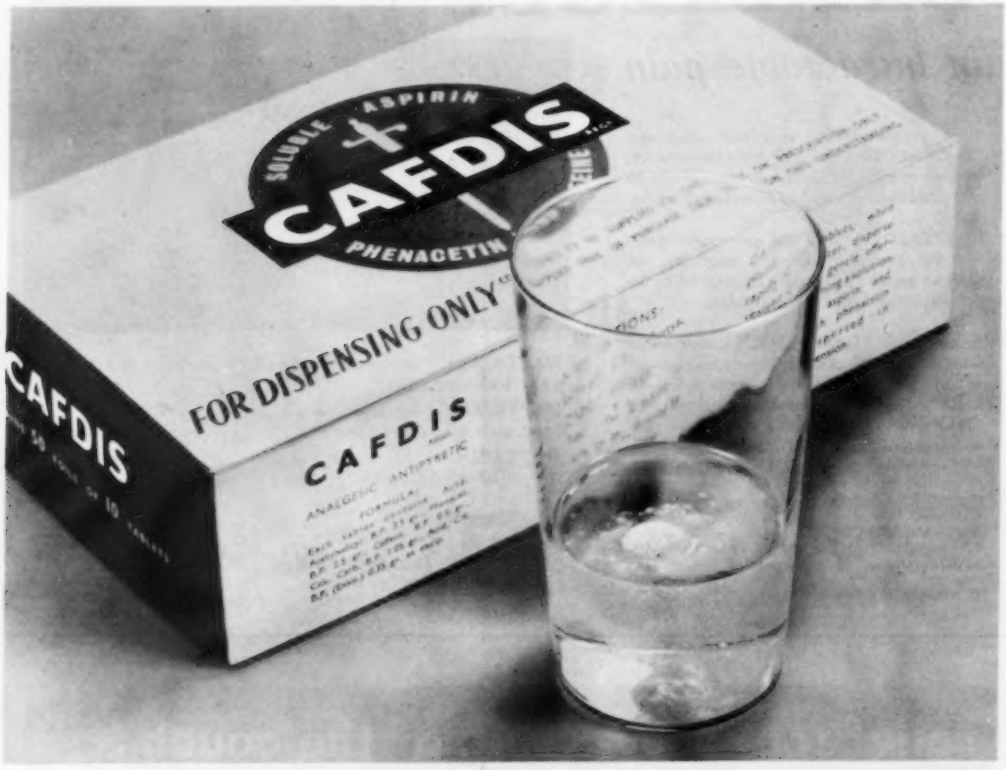

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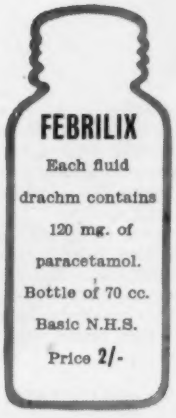

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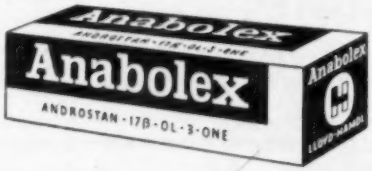

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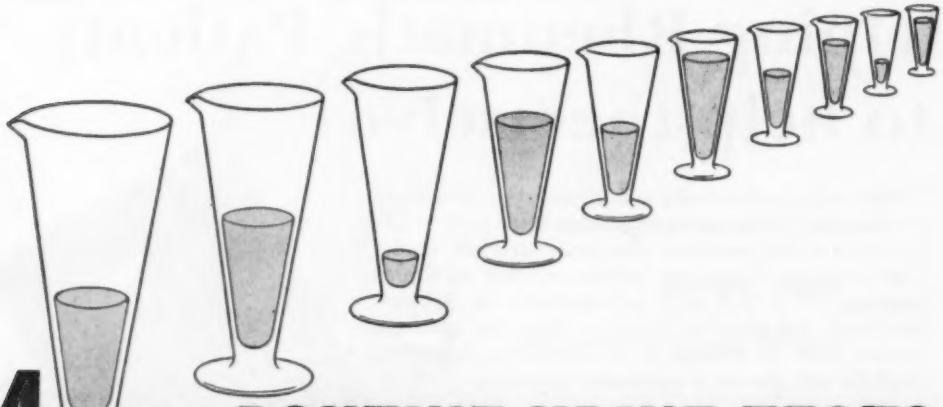

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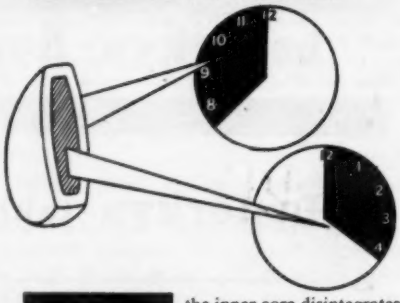

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Antacids in Peptic Ulcer. *The Practitioner*, January 1956, **176:** 103

Recent Advances in the Ulcerative Diseases of the Gastrointestinal Tract. *Amer. J. Gastro.*, December 1956, **26:** 665

Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer. *Amer. J. Dig. Dis.*, March 1955, **22:** 67-71

Management of Peptic Ulceration in General Practice. *Med. World*, December 1954, **81:** 591-601

Clinical Investigation into the Action of Antacids. *The Practitioner*, July 1954, **173:** 46

Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.*, 23rd January 1954, **1:** 183-184

Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. & Clin. Med.*, 1953, **42:** 955

The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.*, 28th November 1953, **2:** 823-824

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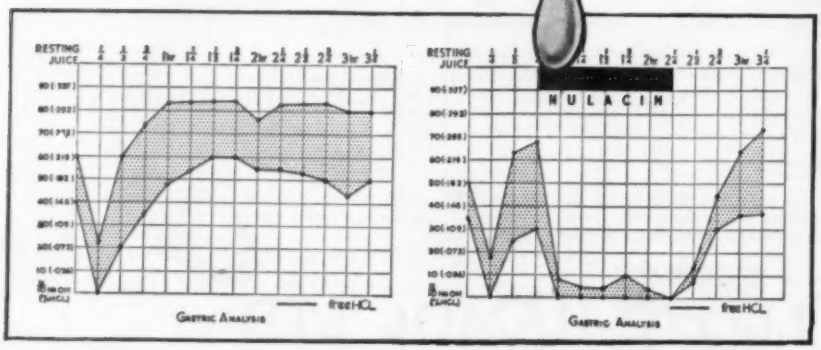

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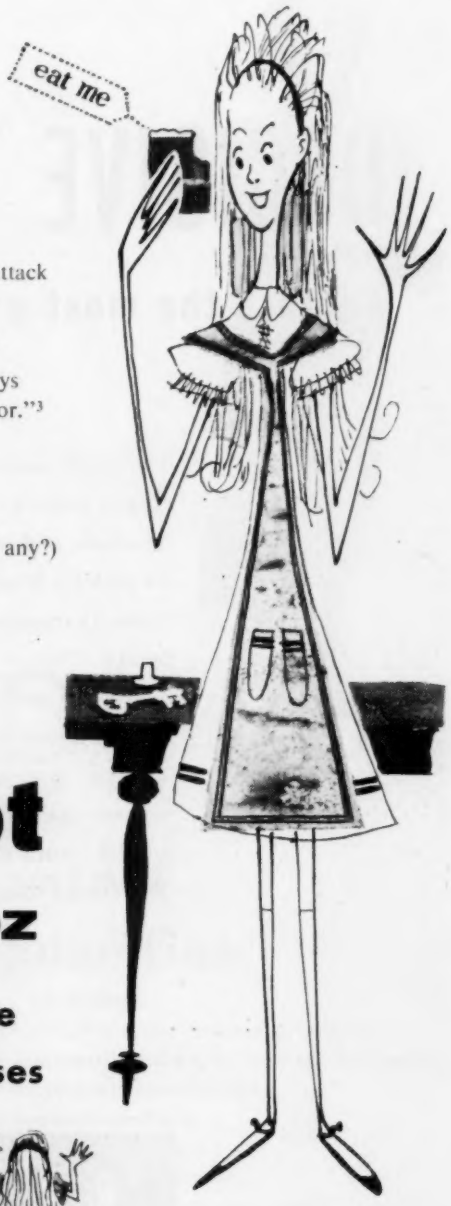
[1] *J. nerv. ment. Dis.* (1952) **116**, 346 [2] *Lancet* (1956) **1**, 794
[3] *Canad. med. Ass. J.* (1955) **73**, 701



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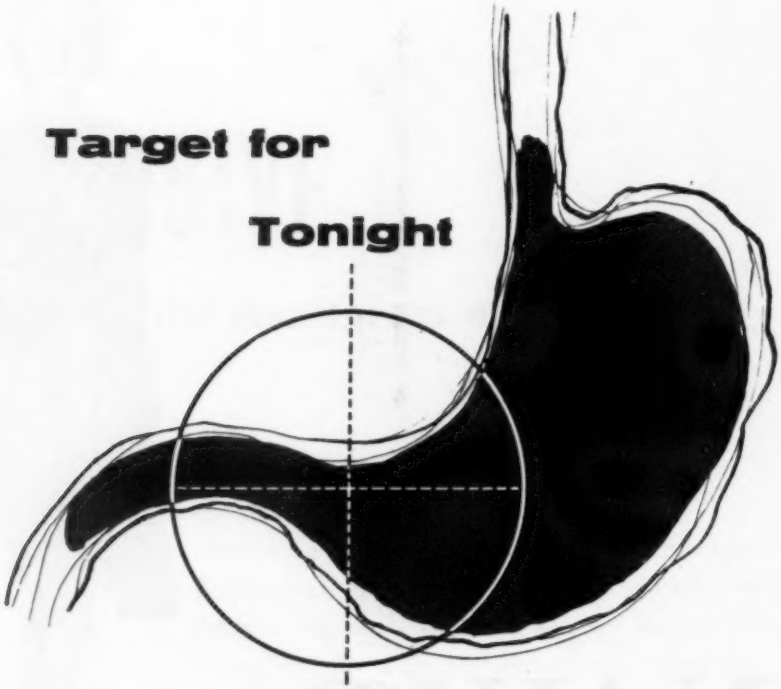

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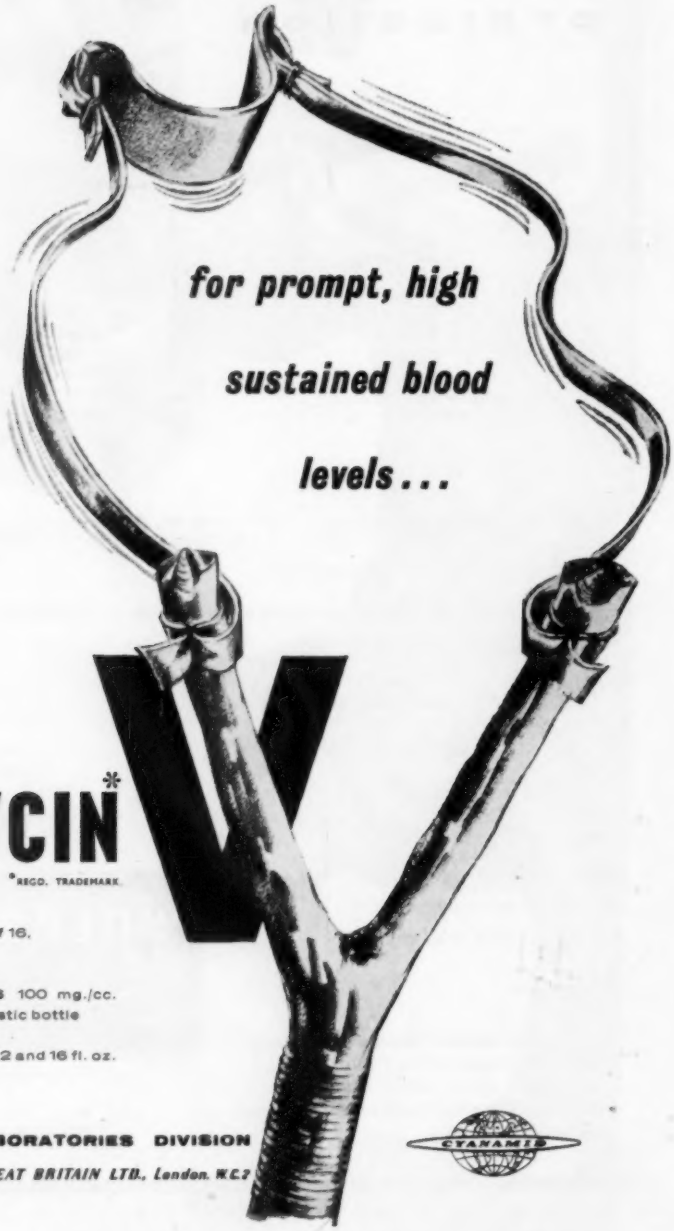

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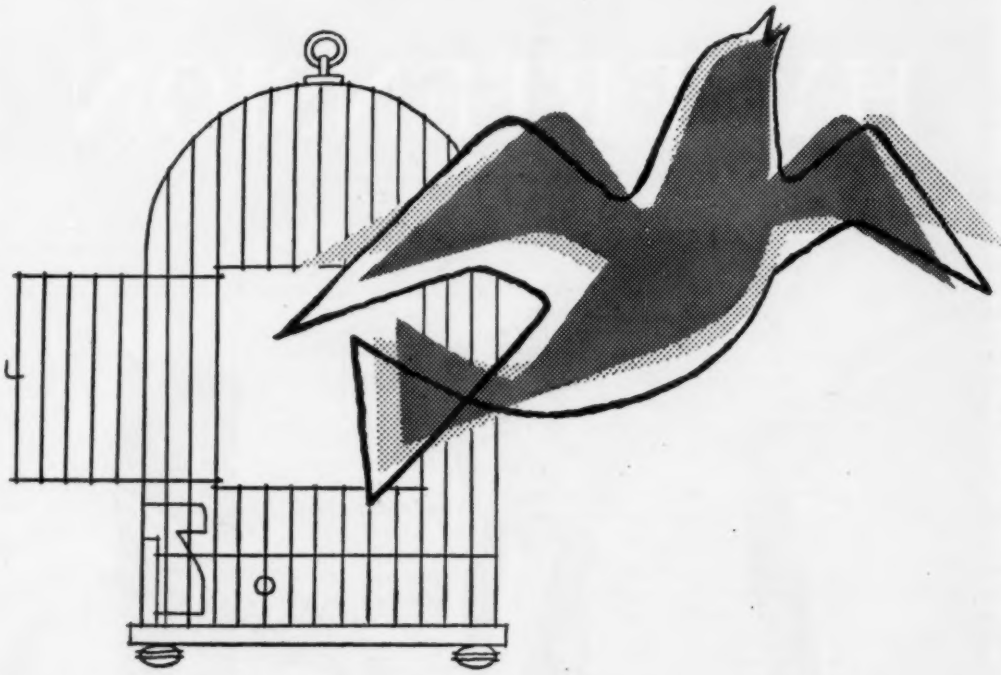

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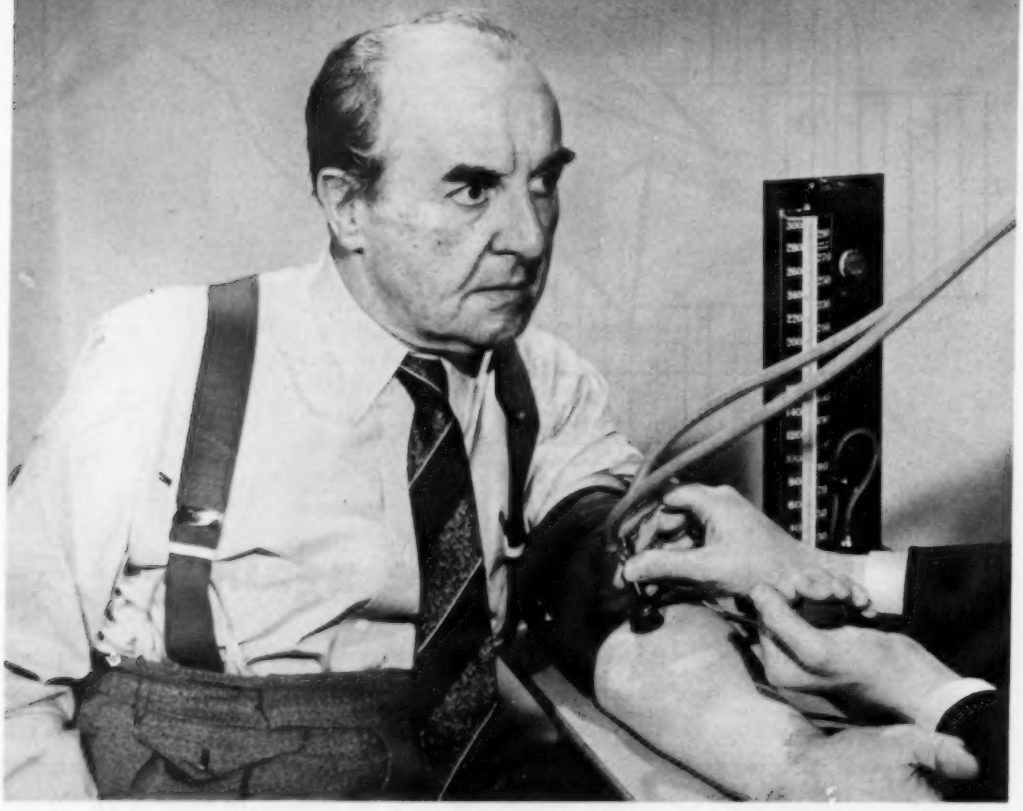

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REFERENCES: *Nature* 1958, *181*, 1397; *Nature* 1958, *181*, 1717; *Lancet*, 1958, *ii*, 6.

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A. DOYNE BELL
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PHYSICIAN IN CHARGE OF THE CHILDREN'S DEPARTMENT, CHARING CROSS HOSPITAL, LONDON, W.C.2

EARLIER this year, Viscount Samuel wrote:

"Freudian Psychology has established the existence of unconscious and subconscious levels in the mind beneath the conscious. The consequences of this discovery, realised at first in medicine, have spread to ethics, to sociology, and so to criminology. . . . To talk of personal responsibility, it is argued, is out of date. Praise, blame, reward and punishment are quite outmoded; every fault, every vice, every crime even, is to be viewed with 'broadmindedness,' toleration and sympathy."

But this view, Lord Samuel suggests, is based on the fallacy of supposing that, because the subconscious has been found to be of great importance, the conscious has become of no importance. I would go further and say that, though healthy development depends on a background of love and security, it is an error to suppose that security is jeopardised by discipline and that the child will feel secure only when it is allowed to express its own will and whim.

The analytical school of child psychiatrists hold that the child should be allowed to gain experience in its own way, and believe that this will be more profitable to it than the best intentioned advice. "Everywhere and always it needs to feel responsibility for what it does" (Ganz 1953). This school must, I think, take their share of responsibility for the effect of what they have been teaching, but we too, as children's doctors, must take our share, in so far as we have tended to regard the psychological problems of our patients as distinct from their physical ills.

Even more dangerous, perhaps, has been the effect of those ideas on parents, who have come to think of themselves as guilty people whose natural impulses towards their children are likely to be wrong. Indeed, many American parents have become reluctant to take any firm line in the management of the child's upbringing until there has been a consultation with a child psychiatrist.

Habits—Good and Bad

In this climate of Freudian laisser-faire we tend to neglect an important, if old-fashioned, formative feature of the child's life—namely habit.

What is habit? The word itself has two meanings and they are defined in the dictionary as "a custom", or "a costume"; the costume, such as a riding habit, being often a customary or conventional costume—the costume habitually worn on a recurring occasion. The philosopher Hobbes, writing in 1656, says: "Habit is motion made more easy and ready by custom." Locke, in his *Essay on the Human Understanding* says: "each power or ability in man of doing anything, when it has been acquired by frequently doing the same thing, is that idea we name habit", and Paley, writing of habit, says: "Habit, the instrument of nature, is a great leveller. The familiarity which it induces taking off the edge both of our pleasures and of our sufferings."

May I interpolate a modernisation of Paley and interpret him as saying in effect that habit is Nature's tranquilliser?

In considering habit we at once face the distinction between good habits and bad habits, and the question whether some so-called bad habits are not conditioned reflexes. The throat-clearing cough when the throat is quite clear, the nervous blink when the conjunctival irritation has gone—these are certainly examples of simple reflexes gone astray, and can be said to be conditioned in so far as the movement is now not fired off by the primary stimulus. They are called bad habits because they have antisocial properties: they tend to annoy the spectator and are thus social handicaps to the performer. But if we believe them to be conditioned responses they have a significance and probably even a release value to their owners. We are all so hedged about by mannerisms and acts of stereotyped behaviour that we should hesitate to dismiss such tics, with their personal historical significance, as mere bad habits.

Indeed, the classification of habits as good and bad is not entirely satisfactory—for many reasons, and not least because it is necessarily subjective. Nevertheless we ought not to be too frightened of the words "good" and "bad", unfashionable though they are in psychiatric circles today. If we are honest with ourselves, we think we know quite well what we regard as bad habits and what good; and certainly the parents of our patients think they know. They do not, after all, come to consult us about their children's good habits.

A more serious difficulty of classification is that habits which are regarded as bad in one environment are accepted as good, or at least tolerable, in another environment.

Through a chronic nasal infection in the past, a child may acquire the habit of sniffing. Sometimes this is regarded as bad manners and invites a rebuke with an almost moral tone; sometimes the parents find it so exasperating that they can hardly tolerate the sniffing child. In so far as it sets up a tension between the child and its parents the repeated sniff must be regarded as a bad habit. But it fits perfectly into the idea of habit as a labour-saving device. It saves you getting out your handkerchief and blowing your nose. It even saves you the labour of acquiring the habit of carrying a handkerchief.

In contrast to tics, such as the sniff and the blink, bedwetting is *not* an acquired bad habit, but the failure to acquire a good social habit—which brings us to the question whether a good habit is an acquired skill. Certainly some good habits at any rate appear to be acquired by a mechanism not dissimilar from that described by Lord Adrian in his Sherrington lecture (1957):

"To ride a bicycle or drive a car involves the kind of skilled behaviour only possible at the cerebral level. It needs the distance receptors and the habits impressed on the cerebrum by previous activity. Some of it depends, like human walking, on acquired habits of movement. . . . Once the brain has acquired this skill, or indeed any skill, most of the operations required in it seem to be carried out almost as unconsciously as breathing or walking, although they demand most of the powers of recognition, generalization and judgment that are often considered as properties of the mind."

* Abbreviated from a presidential address given to the section of pædiatrics of the Royal Society of Medicine on May 30, 1958.

Hilaire Belloc evidently shared Lord Adrian's view that " thought is not a necessary accompaniment of intelligent action ". The water beetle, he wrote:

> " Flabbergasts the human race
> By gliding on the water's face
> With ease, celerity, and grace;
> *But if he ever stopped to think*
> *Of how he did it, he would sink.*"

The Purpose of Childhood

Is childhood an episode to be enjoyed, an experience to be endured, or an adventure to be enacted? Usually, I hope, it is a bit of all three; but clearly one of its chief purposes is to allow the child to learn the cultural pattern of the community and his own place in it. This process of learning requires some endurance, but is on balance pleasurable to the child. And it is the foundations of future pleasure and happiness and a sense of security.

I do not use the word " security " in a sense antithetical to adventure. As Mr. Eric Linklater has pointed out, " every successful adventure has behind it a hinterland of sedulous preparation. Physical preparation, material preparation and the more mysterious preparation of seeking persistent and courageous spirit." The need for discipline or habit-training and security as a base for adventure is not always appreciated, but in my view all properly conducted adventures must have a base of security, and the adventure of childhood is no exception.

Admittedly childhood is not a period in which the normal child seeks relaxation. Vegetation and letting things wash over you is not in accordance with the instincts of healthy childhood. But the base of the child's adventure should be secure. The " silver cord ", the life-line which is an extension in time of the umbilical cord, should be tactfully paid out and wound in, and at all times most firmly held at the parents' end until the child finally casts it away at his end at his own chosen moment.

Habit and Choice

If we accept that habit is a psychologically labour-saving device, we must ask ourselves whether the labour so saved is well saved. Effective human action can stem from three impulses—habit, whim, or intellectual choice. Essentially the labour which habit saves us is the effort of choice.

Choice, even at its lowest level of expression, is an intellectual process. The kind of animal experiments which involve something that superficially looks like " choice ", are really dealing, I think, with something different and essentially not intellectual.

Thus a rat, after many errors and repeated errors, will learn to find his way through a series of obstacles to the source of food. The rat seems to learn the way to the food and to memorise his learning. But the choice on which his learning is based hardly exists. The animal has, with much toil, established a habit.

The learning child, on the other hand, if he is intelligent, does not struggle with an obstacle for very long; he is seen to stand back and think.

I shall not commit myself to stating an age at which the average child demonstrates to our observation that choice is playing some part in his behaviour; but it is pretty early in the first year of life.

I do not think, however, that we should regard " I like " and " I don't like ", as expressed in them by smiles, expressions of contentment, and sleep or by crying and restlessness, as connoting " choice " in the infant. The satisfied infant after a breast feed pushes away and hopes, we may suppose, to fall into contented sleep. If pressed, for theoretical and extraneous adult reasons, to suck more, he will usually push away again and cry. No choice, I suggest, is involved in this reaction. " I don't like " is not the same as a later " I have considered and decided against ".

Choice is not concerned either with externalising an emotional response to a pleasant or an unpleasant situation, or with an irrational and unplanned escape from an unpleasant situation. Choice consists in a criticism and a rationalisation and an assessment and a plan for future action—all intellectual processes and possibly based on memory.

True choice is a fatiguing process. We find it fatiguing in adult life, and we find it more fatiguing I think (though I'm not sure of this) if we have to make our choice on insufficient criteria. Also, as well as fatiguing, it is a process which is to a certain extent distasteful to the child's mind. It sometimes seems almost as if the child knew, or perhaps felt, that his experience and therefore his basis of choice was insufficient.

If you place six desirable toys in front of a child, he will immediately show pleasure and interest. If you then say " You can have *one* of these toys to play with. Choose one ", you will see the expression of pleasure disappear from the child's face and disappointment or puzzlement, or even sometimes a complete lack of interest, take its place. Toys are fun; but making choice of a toy is not fun, it is a bore.

I recall a patient of mine who was under the care of a child psychiatrist because he would not eat. When I saw him, because of a chest infection, he had beside his bed a, to me, rather repulsive wooden box with 9 compartments in which he was encouraged—by his mother and the psychiatrist—to put a variety of bits and pieces of food, so that at any time of the night or day when he felt inclined he could pick out a bit of food and eat it. At the age of 6 he said to his father, with a very weary sigh, " Is there no-one in this house who can order meals?"

Teaching of Habits

An important and characteristic attribute of the developing animal's central nervous system is the capacity to encourage the useful response and to discourage and suppress the useless, the inefficient, the disadvantageous.

But which habit is useless, inefficient, or disadvantageous can be determined only by experience—and experience is what the child lacks. One would think, therefore, that borrowed experience—in other words teaching—is the inexperienced child's best hope for progress in this direction. As to the form which such discipline and teaching may take, it seems that we must balance the value of the habit to be achieved, or the disadvantage of the habit to be discarded, against the time taken by the process and the discomfort associated with the process. Sometimes it clearly is not worth the time and trouble. Sometimes it is. Henry Cotton (1952), for instance, says that most people suffer a pretty painful crick in the neck in the process of acquiring a " free-riding head " inseparable from an efficient golf-swing. Some people find the crick worth while.

Experience of this educative kind can be compressed and shortened by formative environment. That is simply another way of saying that education and discipline are the shortest cuts to sound habit formation.

Children at School

The revolt among parents against traditional disciplines, both in the home and at school, is largely no doubt, a reaction from the strictness of Victorian home discipline, and the irrationality and brutality of the public-school discipline. But in the early elementary schools, too, discipline had to be rigid and sometimes even harsh, partly because the idea of going to school at all was so new, but more particularly because children were taught in such enormous classes, which could easily have become bedlam. The gradual change in the methods of discipline in the State schools stems from the experimental schools at the beginning of the century, and especially from the influences of the early nursery schools which spilled over into the State infants' schools. There was a period in which methods of discipline in many State schools which called themselves " progressive " became so relaxed that the schools and the education they gave suffered badly. But modern methods of school discipline, though much freer than in Victorian schools, are sensible and take into account not only the nature of children but the nature of a decent relationship between adult teachers and child pupils.

The ideas of freer discipline, of course, seeped down among the parents themselves. What many parents now believe, and suppose themselves to be practising, are the outmoded educational theories of fifty years ago. They still think it progressive not to insist on discipline, though the educational world has moved a long way away from this kind of thinking. Moreover, their so-called progressive beliefs are powerfully reinforced by their natural laziness, by their increasing concentration on their own leisure pursuits, and by their unwillingness to take seriously the upbringing of their children. Naturally, as many of these parents do not insist on any settled framework of discipline in their own homes, they do not understand, and sometimes resent, its application to their children in school.

There is one important disruptor of rhythm and habit in schoolchildren's lives today which must be briefly mentioned—the 11-plus examination.

Disturbed children are brought to outpatient clinics by worried parents for faulty habits, and behaviour problems, and even somatic symptoms which seem to be associated with this exam. Too often the attitude of the parents has produced the disturbances among these children. The ambitious parent and the worrying parent are well known in this context to teachers and to education officers. And, of course, the trouble is that the parents really have something to worry about. So long as we keep secondary education in the two compartments of grammar schools and " the rest ", entry to the grammar school must assume great importance.

Conclusion

It seems that we have constructed our Brave New World and Welfare State in a way which puts habit in childhood at a discount, and fosters anxiety by insistence on whim often mistaken for choice as a form of self-expression.

REFERENCES

Adrian, Lord (1957) *Proc. R. Soc. Med.* **50**, 991.
Belloc, H. (1899) A Moral Alphabet. London.
Cotton, H. (1952) My Swing; p. 13. London.
Ganz, M. (1953) Psychology of Adolph Adler and the Development of the Child; p. 33. London.
Hobbes, T. (1656) Elementary Philosophy.
Linklater, E. (1947) The Art of Adventure; p. 275. London.
Locke, J. (1695) Essay on the Human Understanding.
Paley, W. (1819) Natural Theology.
Samuel, Viscount (1958) *Sunday Times*, March 2.

HUMAN AUTO-IMMUNE THYROIDITIS: SEROLOGICAL STUDIES

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THE presence of thyroglobulin autoantibodies in the serum of patients with Hashimoto's thyroiditis (Roitt et al. 1956) and with " primary " myxœdema and subacute thyroiditis (Doniach and Roitt 1957) has been demonstrated using gel diffusion-precipitation techniques. Similar results have been reported by Witebsky et al. (1957), and by Goudie et al. (1957); in the investigations of the former group the more sensitive tanned-red-cell agglutination test was employed. While the evidence indicates that the precipitating antibodies are directed against thyroglobulin (Witebsky et al. 1958, Roitt and Doniach 1958b, Roitt, Campbell, and Doniach 1958), Trotter et al. (1957) described an antigen in extracts of thyrotoxic glands capable of deviating complement in the presence of Hashimoto sera and obtained evidence suggesting that the antigen was distinct from thyroglobulin. They also showed that the complement-fixing antibody was present in the sera of Hashimoto patients which were negative in the precipitin test, and in the sera of some patients with thyrotoxicosis and " primary " myxœdema.

We report here a survey of the incidence of thyroid autoantibodies in the major thyroid diseases studied by the precipitin reaction, and the more sensitive complement-fixation and tanned-red-cell agglutination tests. Evidence is also presented to support the view that the complement-fixation reaction with thyrotoxic thyroid extracts reflects a genuine antigen-antibody combination and that the antigen concerned is distinct from thyroglobulin itself. Some of the results are being published in the accounts of symposia (Roitt and Doniach 1958a, Doniach and Roitt 1958).

Materials and Methods

Preparation of Human Thyroglobulin

The method of Derrien et al. (1948) was followed.

Normal postmortem thyroids or operation specimens of thyrotoxic and non-toxic nodular goitres are stored at −20°C until required. The frozen glands are thinly sliced with a razor and extracted with 3 vol. of 0·9% NaCl overnight at 4°C. The extract is filtered through muslin and centrifuged to remove gross particles. The supernatant is brought to 42% saturation with $(NH_4)_2SO_4$ at room temperature. The precipitate is spun down, resuspended in 45% saturated $(NH_4)_2SO_4$, and the concentration of $(NH_4)_2SO_4$ reduced to 37% by addition of water. After stirring for 2–3 hours the insoluble impurities are removed by centrifugation and the thyroglobulin precipitated from the supernatant by adding $(NH_4)_2SO_4$ to 42% saturation. The precipitate is washed with 42% saturated $(NH_4)_2SO_4$, and dialysed against running tap-water for 12 hours and against distilled water for 2 days. The thyroglobulin solution either may be freeze-dried and the powder kept in screwcap containers, stored over silica gel at −20°C, or may be dialysed against a large volume of 0·9% NaCl and the solution stored in the frozen state in a number of small tubes.

Precipitin Reaction

The Oakley and Fulthorpe agar double-diffusion modification of Oudin's method as applied to the thyroglobulin precipitin system (Doniach and Roitt 1957) was used.

The Tanned-red-cell Agglutination (T.R.C.) Test

Boyden's technique as applied to the detection of thyroid antibodies by Witebsky and Rose (1956) was used with some modifications.

Human group-O cells, used within 3–4 days of drawing into citric-acid/dextrose solution, are washed 3 times with phosphate buffer pH 7·2 (34 g. NaCl; 7·4 g. anhydrous Na_2HPO_4; 2·15 g. anhydrous KH_2PO_4; volume made up to 5 litres with glass-distilled water and a few drops of toluene added as a preservative) and made up to a 4% cell suspension. The cells are mixed with an equal volume of fresh tannic-acid solution (5 mg. per 100 ml. buffer; Merck) and allowed to stand at room temperature for 10 minutes with occasional shaking. The tanned cells are centrifuged gently (approx. 500 r.p.m. for 3 minutes), washed once in buffer, and resuspended to a 2% suspension. The cells are then mixed with an equal volume of human thyroglobulin solution (2·0 mg. per ml.) and left at room temperature for 30 minutes with occasional shaking. The antigen-coated cells are gently centrifuged and washed carefully three times with buffer containing 1% human or rabbit serum (previously inactivated for 30 minutes at 56°C and in the latter case absorbed with washed human group-O cells) and made up finally to a 1% cell suspension in 1% serum-buffer.

Serial dilutions of the serum to be tested (inactivated previously at 56°C for 30 minutes) are made in 'Perspex' agglutination trays containing 10×8 1-ml. cups (R. B. Turner & Co. Ltd., 10, Eagle Street, London, W.C.1) using the buffer containing 1% normal serum. Dilutions of 1 in 5, 25, 250, 2500, 25,000, 250,000, and 2,500,000 are customarily made leaving 0·1 ml. of the serum dilution in each cup; the 8th cup contains a 1/5 serum dilution plus 0·1 ml. of either a thyroglobulin solution (25 mg. per ml.) or a thyroid extract to serve as an antigen inhibition control. The tanned-coated cells (0·1 ml.) are then added to each cup, and after thorough mixing the trays are allowed to stand for 2–3 hours at room temperature, then overnight at 4°C before the tests are read. The end-point is taken as the highest serum dilution giving an even carpet of cells over the bottom of the cup (cf. Stavitsky 1954) and the titre is expressed as the reciprocal of this dilution. The control test should be completely negative; if a positive result is obtained the test should be repeated after absorption of the serum with washed untreated group-O cells. For the screening of a large series of patients, serial dilutions of serum were made with a single pipette; and, although this procedure is subject to considerable absolute error at high dilutions, the relative values obtained accorded well with the anti-thyroglobulin level determined by other methods. Furthermore the minimum concentration of thyroglobulin required to inhibit agglutination of a 1/5 dilution of serum paralleled the agglutination titre. When separate pipettes were used for each dilution, titres of up to 1,000,000 were obtained with Hashimoto sera positive in the agar-precipitin test. If desired, calibrated Pasteur pipettes giving standard drops are convenient for serial dilutions of serum. Using immunochemical techniques, thyroglobulin, prepared by the method described, can be readily shown to contain small amounts of serum-γ-globulin which might coat the cells and render them agglutinable in certain instances—for example, in the presence of sera from patients with rheumatoid arthritis giving positive Waaler-Rose tests. However, such sera did not give positive reactions with thyroglobulin-coated tanned cells under the conditions used.

Complement-fixation (C.F.) Test

The method of Belyavin (1953) was used initially, but later the semi-micro method of Donnelley (1951) was followed with some modifications.

Sera were stored at −20°C and inactivated for 30 minutes at 56°C before testing. *Complement* (C′) preserved in Richardson's salt solution (Burroughs, Wellcome) was used. *Antigen:* Fresh thyrotoxic thyroid gland * removed at operation was homogenised in a tissue blender with 4 volumes of buffer, filtered through muslin, and centrifuged at 3000 r.p.m. for 15 minutes at 4°C. The supernatant was stored in small tubes at −20°C to avoid thawing and refreezing. The optimum dilution of antigen was found by chessboard titration with positive sera of known titre. At the dilution selected the antigen should not consume more than $^1/_4$ minimum hæmolytic dose (M.H.D.) of C′. Glands from patients with C.F. antibodies in their serum gave poor antigens. A good antigen preparation can be used for about 3–4 months without loss of potency. *Buffer:* NaCl (8·50 g.), anhydrous $CaCl_2$ (0·0275 g. or 2·48 ml. of an *M*/10 solution), $MgCl_2.6H_2O$ (0·192 g.). H_3BO_3 (1·20 g.), and $Na_2B_4O_7.10H_2O$ (0·052 g.) were dissolved and made up to 1 litre in distilled water; pH 7·0. *Hæmolytic system:* a standardised 3% sheep-cell suspension is sensitised with 5 M.H.D. of hæmolytic serum.

Test.—The test is done in perspex trays as used for the T.R.C. test with calibrated pipettes delivering 30 drops per ml. One drop of each reagent is used for the test. Serum and antigen are incubated for 1 hour at 37°C with 2 M.H.D. of C′ (titrated in the presence of antigen), the hæmolytic system is added, and incubation is continued for a further 30 minutes. Results are estimated visually. Sera were screened at 1/5 and 1/20 dilutions, and minimal fixation (i.e., less than 25% hæmolysis inhibition) was disregarded. Serum controls contained 2 M.H.D. of C′ (titrated without antigen). Known positive and negative sera were included in each batch of tests.

Organ extracts.—Brain, suprarenal, liver, and kidney were removed from a group-O patient at necropsy.

The tissues were disrupted in a tissue blender with 4 vol. of buffered saline (pH 7·0) for 2 minutes. The homogenate was poured through muslin, and centrifuged at 3000 r.p.m. for 15 minutes; the supernatant was stored in a number of small tubes at −20°C.

* Under the conditions used for the test, reasonably potent hæmolytic anti-A sera gave partial fixation of C′ at a serum dilution of 1/5 with a thyroid extract from a thyrotoxic patient of group A; thus it is preferable to use antigens obtained from group-O individuals.

Results

COMPLEMENT-FIXING SYSTEM

Although purified thyroglobulin itself fixes either very little or no complement in the presence of sera from patients with Hashimoto's thyroiditis, Trotter et al. (1957) have shown that saline extracts of thyrotoxic thyroid glands were able to deviate complement in the presence of such sera and suggested that an antigen other than thyroglobulin was implicated.

That there are two distinct thyroid antigen-antibody systems involved in the precipitation and C.F. reactions is shown by the fact that absorption of the precipitins from a Hashimoto serum with thyroglobulin has no effect on the serum titre in the C.F. test. Further, the two antigens appear to be localised at different sites in the thyroid. Thyroglobulin is predominantly intrafollicular, although the apical margins of the epithelial cells are also stained in the Coons fluorescent-antibody technique using a Hashimoto serum containing precipitins (White 1957). The C.F. antigen, on the other hand, is probably entirely intracellular since cell-fractionation studies carried out on homogenates of fresh thyrotoxic glands disrupted in 0·25 *M* sucrose in a Potter-Elvehjem homogeniser showed that the antigen was confined to the "microsome" fraction which sedimented at 105,000 *g* after removal of the inactive "nuclear" and "mitochondrial" fractions; rarely, weak activity was recovered in the supernatant fraction. The antigen could also be demonstrated in the "microsome" fractions obtained from normal glands and from non-toxic nodular goitres.

The C.F. activity of a single toxic adenoma, which resembled thyrotoxic tissue in so far as its high iodine uptake in vivo was not diminished by triiodothyronine, was compared with that of the normal opposite thyroid lobe which had no iodine uptake owing to the suppression of endogenous thyroid-stimulating hormone caused by the autonomous toxic nodule. Positive C.F. was obtained with the adenoma extract, but the normal lobe was inactive. While these results and the particularly potent C.F. activity of thyrotoxic extracts might suggest that this antigen is specific to thyrotoxicosis, the consistent finding of activity in the "microsome" fractions from all functioning glands studied and the widespread incidence of C.F. thyroid autoantibodies would argue against this. More probably, the greater abundance of the antigen in thyrotoxic glands reflects a higher content of follicular cells and their increased secretory activity.

Since the C.F. test using tissue antigens may yield equivocal results, it is desirable that certain criteria be satisfied before these results are interpreted confidently on the basis of an antigen-antibody reaction. Probably the most convincing of these criteria is the demonstration of some degree of specificity in the reaction. It has been possible to show that the thyroid antigen is probably organ-specific and that the antibody cross-reacts only

COMPLEMENT-FIXATION TEST WITH HUMAN ORGANS

Group	No. of patients	% giving C.F. with extracts of:					% giving C.F. with thyrotoxic thyroid only
		Brain	Liver	Kidney	Supra-renal	Thyrotoxic thyroid	
Control	195	0	0	0	0	0	0
Patients with thyroid auto-immunity ..	167	12	4	4	3	100	87

with thyroid from closely related species. Thus the possibility of cross-reaction of Hashimoto sera with extracts of other human organs was studied using the complement-fixation test; the results are shown in the accompanying table. Only patients with thyroid disease whose sera gave positive C.F. with thyrotoxic thyroid extracts were included in this series. The majority (87%) failed to give positive reactions with extracts of liver, kidney, and brain, and among these were sera giving a high titre in the C.F. test with thyroid. Thus the thyroid antibody appears to be organ-specific and in the few cases where reactions are obtained with other organ extracts it must be presumed that factors in the serum other than the thyroid antibody are responsible. It is not established whether the fixation of complement in these other systems is due to an orthodox antigen-antibody interaction or whether a non-specific phenomenon is involved (such as that described by Cruickshank [1958] using human kidney antigens), but the incidence of these reactions is higher in individuals with thyroid auto-immunity than in the control group consisting of normal individuals and patients with various conditions in which thyroid auto-immunity was not implicated. On testing Hashimoto sera against thyroid extracts of other mammals it was found that strong positive reactions were obtained with the rhesus monkey and chimpanzee, but under the conditions of the test extracts of rabbit, guineapig, rat, beef, sheep, pig, and horse thyroids were inactive. This narrow range of species specificity exactly parallels previous findings with the thyroglobulin precipitin (Roitt, Campbell, and Doniach 1958).

Further support for the view that a "classical" antibody is involved was obtained from a study of the electrophoretic mobility of the active fraction. A Hashimoto serum was subjected to electrophoresis on Whatman 3 MM paper under conditions described by Flynn and de Mayo (1951). On completion of the run, the electrophoretic fractions were located by staining of marginal strips and the appropriate sections of the paper were eluted. A small volume of a negative serum was added to each fraction to minimise anticomplementary effects. Only the γ-globulin fraction gave positive C.F. with thyrotoxic thyroid extracts. Further, the criterion for an autoantibody was met in that the antibody deviated complement in the presence of extracts of the patient's own thyroid gland. It is of interest that with a few Hashimoto sera a distinct prozone in the antibody excess zone is found, somewhat reminiscent of the non-precipitation of specific complexes with thyroglobulin in antibody excess with Hashimoto sera giving a "horse-type" flocculation curve (Roitt, Campbell, and Doniach 1958).

INCIDENCE OF THYROID AUTO-IMMUNITY

Control Group

Random sera sent to the laboratory for blood-grouping or for cholesterol estimations, excluding patients with thyroid disease, were tested by C.F. against thyrotoxic thyroid; all of 195 sera gave negative results. These results do not agree with the findings of Goudie et al. (1958), but this may be due to the fact that all sera were tested at a dilution not less than 1/5 using 2 M.H.D. of complement and disregarding minor degrees of hæmolysis inhibition; in addition the sera were not selected as regards age and sex.

The T.R.C. test was done on 148 other sera obtained similarly, and was positive in 10 patients of whom 2 proved to have thyroid disease on further investigation; excluding these, the titres obtained were 5 and 25 in 7 patients with diabetes, cholecystitis, obesity, nephrosis (2), and no obvious disease (2), while a titre of 250 was obtained in a case of Paget's disease.

Hashimoto's Disease

The preoperative sera of 106 Hashimoto patients were submitted to the precipitin, C.F., and T.R.C. tests. Of these, 55 were proved histologically; but, unless biopsy was done, only cases tested before or within 3 weeks of operation were included since the antibody level gradually falls off after removal of the goitre. The remaining 51 patients were diagnosed on the basis of clinical and

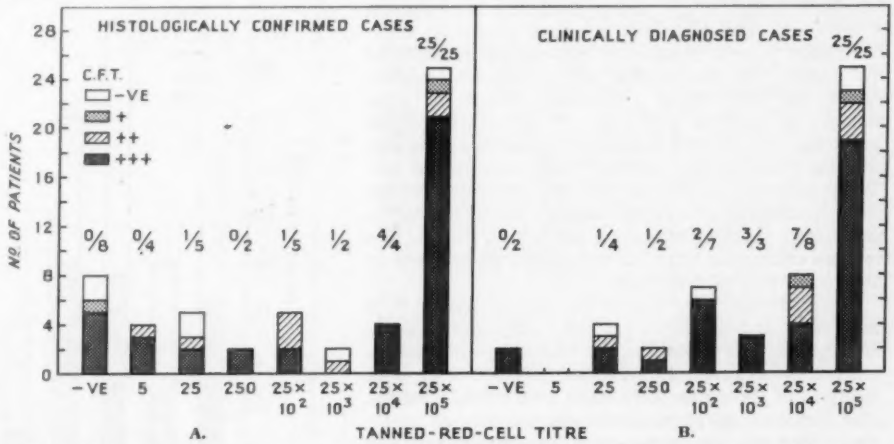

Fig. 1—Incidence of thyroid autoantibodies in Hashimoto's disease: A, histologically confirmed cases tested before or within 3 weeks after operation; B, clinically diagnosed cases untreated or treated with thyroid hormones.

The tanned-red-cell agglutination titre is expressed as the reciprocal of the highest serum dilution giving "one-plus" agglutination. Complement-fixation results: +++, complete fixation at serum dilution of 1/20 or more; ++, complete fixation at 1/5; +, partial fixation at 1/5. The proportion of patients with precipitins is shown above each column.

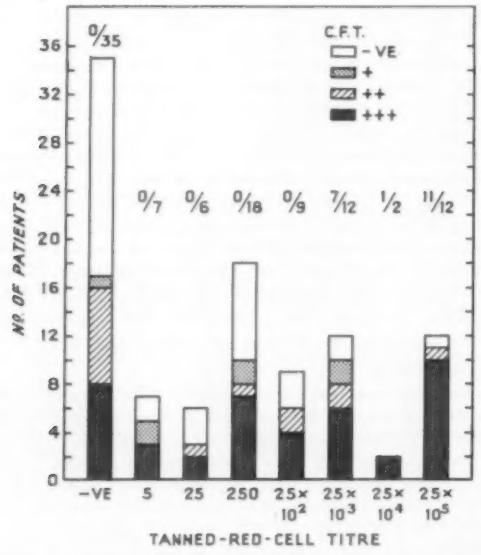

Fig. 2—Incidence of thyroid autoantibodies in spontaneous adult myxœdema. Results expressed as in fig. 1.

laboratory findings and the favourable response of the goitre to thyroid administration. The majority were middle-aged women with a firm goitre, which was often symmetrical and usually painless, who were either euthyroid or had hypothyroidism. Determination of the basal metabolic rate and serum-cholesterol level, ^{131}I uptake studies, and serum-flocculation tests assessed in conjunction with the clinical picture enabled a reasonably certain diagnosis to be made. With thyroid medication the goitres either disappeared gradually or became smaller and softer.

The results of the serological tests on the proved and the clinically diagnosed groups are shown in Fig. 1. The overall patterns obtained are sufficiently comparable for the two groups to be considered together. Circulating antibodies were found in all but 2 patients, and the levels were high enough to give visible precipitins in two-thirds of the cases. The 2 patients who gave completely negative results were both advanced and classical examples of the disease with myxœdema, raised serum-flocculation values, and high serum γ-globulins. While the great majority of patients had both C.F. and thyroglobulin antibodies, the sera of 8 patients gave positive results only with the T.R.C. test and another 8 only with the C.F. test. These results are consistent with the view that the two tests demonstrate completely separate immune systems, particularly since, as mentioned previously, the C.F. titre remains unchanged when the precipitins are removed by absorption with thyroglobulin.

C.F. antibodies were present in titres of over 1 : 20 in most cases, and frequently reached 1 : 256 and occasionally 1: 1024. The majority of the Hashimoto sera containing precipitins gave T.R.C. titres of 2,500,000 when serial dilutions of the serum were made with a single pipette. The incidence of positive precipitins decreased as the T.R.C. titre fell, but, although in general the two tests correlated well, occasional discrepancies were noted such as the finding of negative precipitins in sera having high T.R.C. titres and of positive precipitins associated with a low T.R.C. titre. The latter may be due to non-specific precipitation or possibly to the presence of circulating antigen-antibody complexes, though the presence of another antigen cannot be excluded.

In general, antibody titres decreased following subtotal thyroidectomy (Doniach and Roitt 1957, Roitt and Doniach 1958a); and, of 19 patients tested up to 22 years after operation, 14 had low or moderate antibody titres, 2 had precipitins, while 3 longstanding cases were negative by all tests; C.F. antibodies in high titre were still present in 9 patients.

Primary Adult Myxœdema

Spontaneous adult myxœdema approaches Hashimoto's disease most closely in its incidence and pattern of antibody distribution, though negative results were more frequent. Of 101 cases tested by all methods, 83% were positive by one or more tests (fig. 2). Positive C.F. was obtained in 64% of patients and the T.R.C. test was positive in 66%, the two types of antibodies being present together in 47% of patients. Precipitins were found in 19%. Serological tests have proved particularly useful in mild or early cases of thyroid deficiency, in many of which other thyroid function tests were equivocal. Patients with negative results frequently had very longstanding or advanced myxœdema. These findings support the view previously based on histological studies (Bastenie 1944) that primary myxœdema and Hashimoto's thyroiditis have the same underlying pathology.

Thyrotoxicosis

The thyrotoxic gland is particularly predisposed to the development of auto-immunity, but in the majority of patients the titres are quite low. Of 181 cases tested by all methods, 64% had antibodies which were directed against either thyroglobulin (27%) or the cellular C.F. antigen (7%), or both (30%) (fig. 3). The most usual T.R.C. titres were 25–250, and only 2 patients had precipitins. In 1 patient followed up for 1½ years the precipitin has only recently become positive and the thyroid is becoming firmer in consistency, though the patient still

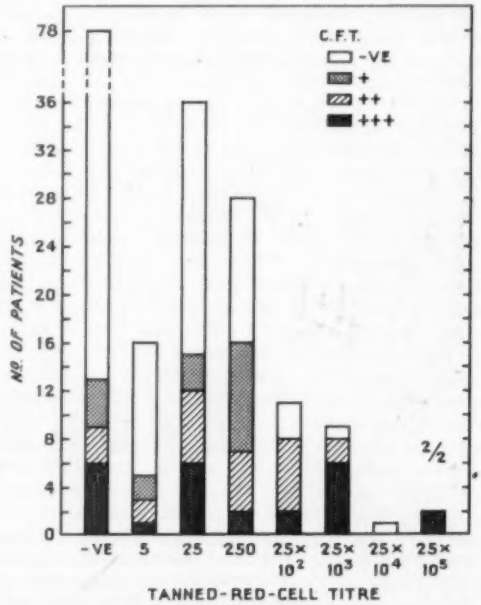

Fig. 3—Incidence of thyroid autoantibodies in thyrotoxicosis. Results expressed as in fig. 1.

requires small doses of anti-thyroid drug to prevent thyrotoxic symptoms.

Localised lymphoid infiltration was found at operation in the majority of those with positive tests, but also in a few who gave negative results. In 2 patients with lymphoid foci, antibodies appeared in the circulation after thyroidectomy (cf. Witebsky et al. 1958) and may have been boosted by surgical trauma, but more often we found lower titres or negative results after thyroidectomy in patients with a low preoperative titre and only sparse lymphoid aggregations.

The incidence and titre of antibodies of patients in prolonged remission after carbimazole treatment were no greater than in the untreated group, and auto-immunity does not appear to play a part in the return to normal function except in the few patients who develop high antibody levels. It is possible that, in time, the latter will become classical cases of Hashimoto's disease or myxœdema.

There is as yet insufficient data on the relationship of serum-antibody levels to the incidence of postoperative myxœdema in thyrotoxics with mild lymphoid lesions. From the studies of Whitesell and Black (1949) and of Greene (1950) it seems that a substantial part of the thyroid must be replaced before myxœdema can be predicted. The thyrotoxic gland has extensive regenerative powers, and cases are known where despite lymphoid invasion the patient has become thyrotoxic again several years after operation (Dunhill 1937). Some patients in our series with moderate antibody titres became myxœdematous after operation, but a comparable number are still euthyroid $1^1/_2$ years after subtotal thyroidectomy. When precipitins are present we believe that the patient should be treated with anti-thyroid drugs since both radio-iodine and surgery would most probably hasten the onset of myxœdema.

Non-toxic Nodular Goitre

Tests were made on 198 cases of nodular colloid goitre (fig. 4) of which 68 have now come to operation and been

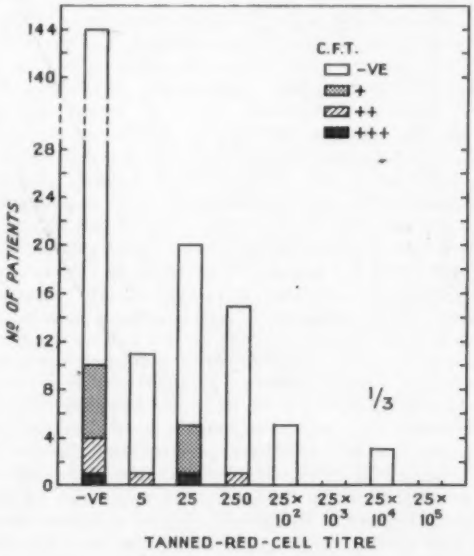

Fig. 4—Incidence of thyroid autoantibodies in non-toxic nodular (colloid) goitre. Results expressed as in fig. 1.

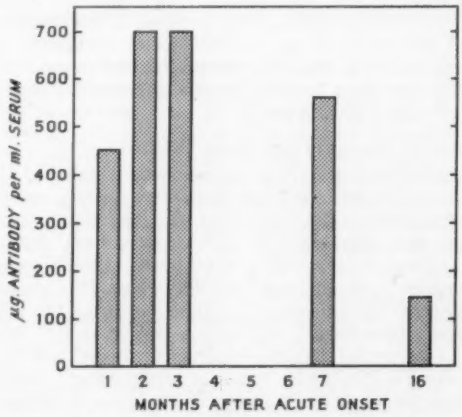

Fig. 5—Thyroglobulin precipitins in a case of subacute thyroiditis.

confirmed histologically. The antibody titres were closely comparable in the histologically proved and clinically diagnosed groups. All tests were negative in 68% of cases; 21% had antibodies of low titre and 10% of moderate titre. Of 3 patients (1·5%) with high tanned-cell titres, 1 has now developed precipitins though she has been treated with gr. 2 of thyroid daily throughout the 2-year period of observation. Localised lymphoid aggregations were found on histological examination in several patients with circulating antibodies, and in 2 cases where the serological tests were negative; in 1 patient with a high T.R.C. titre no lymphoid tissue was seen histologically in the two blocks examined.

Subacute Thyroiditis (de Quervain)

The sera of 19 patients with a history of painful thyroid swelling appearing rapidly and accompanied by fever and malaise were examined. Thyroid antibodies were found in 13 cases (cf. Doniach and Roitt 1957, Paine et al. 1957). At the time of testing, 4 of these cases had progressed to a stage indistinguishable from Hashimoto's disease, and 2 had become myxœdematous without thyroid enlargement. In 5 of these progressive cases histological proof is not available, and the possibility remains that the acute thyroid swelling and pain may have been connected with the auto-immune process (Paine et al. 1957) rather than with an underlying infection (Eylan et al. 1957). 1 patient became myxœdematous within 2 months of a hemithyroidectomy (Druez et al. 1958). Of 12 patients who have recovered without sequelæ, 6 had no antibodies when tested. In 4 patients the antibody titre rose between 8 and 12 weeks after onset and regressed on recovery. These changes are exemplified in a quantitative study carried out by us on serum from a patient with proven subacute thyroiditis (Felix-Davies 1958) obtained at different times during the course of the illness (fig. 5); the antibody levels were estimated by co-precipitation with ^{131}I-thyroglobulin using an anti-human γ-globulin serum (Roitt and Doniach 1958a).

Thyroid Cancer

Of 39 cases of proved thyroid malignancy 71% were negative by all tests; 16% had low titre and 13% moderate titre antibodies (Doniach, Roitt, and Vaughan Hudson 1958). The highest values were found in a case of lymphosarcoma arising in a Hashimoto goitre and in a thyrotoxic patient treated with ^{131}I, in whom a malignant nodule developed 3 years after therapy. Stuart and

Allan (1958) have reported the presence of precipitins in 2 out of 6 cases of thyroid malignancy examined, and serological results must be evaluated in conjunction with clinical and other criteria for the differential diagnosis from Hashimoto's disease.

Thyroiditis Associated with Other Diseases

4 Hashimoto cases with thyroglobulin precipitins also had liver diseases. In 1 of these, liver biopsy showed periportal lymphoid infiltration and fibrosis, and the serum gave positive C.F. with human liver, kidney, adrenal, and brain, as well as with thyroid. 3 further cases of cirrhosis without overt thyroid disease gave positive T.R.C. tests. In 3 patients rheumatoid arthritis was present with thyroiditis. In a further case there was rheumatoid arthritis, dermatomyositis, erythema nodosum, and chronic thyroiditis. 1 case of nephrosis was associated with Hashimoto's disease, and a 2nd case of nephrosis with spontaneous myxœdema. In 1 case of auto-immune hæmolytic anæmia associated with Hashimoto's disease it could be shown that the red-cell and thyroid autoantibodies were distinct and did not cross-react (Wasastjerna 1958).

The sera of 10 patients with Addison's disease were tested for thyroid antibodies but all were negative. Some of these were of tuberculous ætiology, and none had enlarged thyroid glands. 1 case of Paget's disease gave a positive T.R.C. test, and 1 Hashimoto patient had both Paget's disease and liver disease.

PASSIVE TRANSFER STUDIES

A rhesus monkey was injected intravenously with 80 ml. of a Hashimoto serum which contained 4·5 mg. per ml. of thyroglobulin antibody and was shown to cross-react with monkey thyroid in the precipitin reaction and C.F. test. The serum was given in three doses over a period of 5 days. After an initial injection of 20 ml., doses of 20 ml. and 40 ml. were given on the 3rd and 5th days respectively. The injections did not affect the uptake of ^{131}I into the monkey's thyroid; precipitins were demonstrable in its serum at a titre of 1:32—a level frequently observed in Hashimoto patients. The right thyroid lobe was removed under anæsthesia on the 6th day after the initial injection. On histological examination the gland proved to be normal with a perfectly preserved architecture; fluorescent-antibody studies (kindly carried out by Dr. R. G. White), using a labelled antihuman γ-globulin serum, revealed no fixation of human globulin in the monkey gland; fluorescence was observed only in the vascular bed of the thyroid. The experiment was repeated 7 months later, using a Hashimoto serum with 7 mg. per ml. of precipitins and a C.F. titre of 1:64–1:128, giving even better cross-reaction with monkey thyroid (the precipitin and C.F. titres against monkey thyroid were identical with those obtained using human thyroid); 78 ml. of serum was injected within 4 hours, and the remaining left lobe of the monkey thyroid was examined 4 days later with the hope of finding an Arthus-type lesion. Again the results were completely negative both on histology and by Coons's fluorescent-antibody technique.

TISSUE-CULTURE OF HUMAN THYROID IN PRESENCE OF HASHIMOTO SERA

A human thyrotoxic gland was set up in tissue-culture by Prof. R. J. V. Pulvertaft (Pulvertaft et al. 1958) in the presence of Hashimoto sera, selected for their high content both of precipitating and complement-fixing antibodies, with and without fresh guineapig complement. No effect of the Hashimoto sera on the morphology and growth of the cells in culture could be demonstrated.

Discussion

The high prevalence of thyroid autoantibodies in all types of goitre, and the correlation of these serum findings with lymphadenoid changes in the gland, make it probable that Hashimoto's disease and myxœdema are the advanced and extreme degrees of an auto-immune process which in its milder forms is represented by the focal thyroiditis found in other thyroid diseases and in normal elderly women. It was previously postulated that the auto-immune process is cytotoxic and leads to a self-perpetuating destructive chain reaction with progressive lymphoid invasion of the gland (Doniach and Roitt 1957). But the relatively rare progression from minimal lymphocytic foci in a thyrotoxic or non-toxic goitre to fully developed Hashimoto struma despite the presence of circulating anti-thyroglobulin and C.F. antibodies suggests that these antibodies may not in themselves be the direct cytotoxic agent. This view is supported by the negative results so far obtained in passive transfer studies and in experiments with tissue-culture. The temporary presence of autoantibodies in virus thyroiditis shows that the progressive chain reaction does not necessarily become established even when antibodies reach a fairly high titre.

It may be argued that the circulating antibodies are merely a reflection of the pathological process in the thyroid gland, and are not implicated in its causation. While this possibility cannot be discounted, Rose and Witebsky (1956) have shown that the otherwise intact rabbit gland can be intensively infiltrated with lymphoid elements following immunisation with homologous thyroid extract in Freund adjuvant. Many other instances of tissue damage resulting from experimental auto-immunisation employing this mixture of tubercle bacilli and water-in-oil emulsions of the appropriate organs have been described; lesions have been obtained with adrenal (Colover and Glynn 1958), testis (Freund et al. 1953), brain (Kabat et al. 1947), peripheral nerve (Waksman and Adams 1955), and eye antigens (Collins 1953). It is not clear to what extent the tubercle bacillus is involved in these cytotoxic phenomena. Witebsky et al. (1957) reported preliminary results in which thyroid damage was obtained despite the omission of acid-fast bacilli, although the severity of the lesions was diminished; and Schwentker and Rivers (1934) induced allergic encephalomyelitis by immunisation with homologous brain extracts, without adjuvants. The evident enhancement of these processes by the tubercle bacilli may depend not only upon the stimulation of antibody response by these organisms but also upon their ability to confer tuberculin-type sensitisation to the antigen; thus auto-immune tissue destruction may involve a delayed hypersensitivity response similar to that of homograft rejection, in which lymphoid cells are thought to carry "cell-bound antibodies". Indeed, skin reactions of the delayed hypersensitivity type have been obtained in auto-immunised animals as well as in those sensitised by a skin homograft (Brent et al. 1958). This type of sensitisation may be an essential factor in the active and sometimes rapidly progressive lesion of Hashimoto's disease as distinct from the focal lesions which might arise from small injuries to follicles with release of thyroglobulin, though histologically there is no essential difference between focal

and generalised thyroiditis. "Delayed-type hypersensitivity" may not be the only factor in producing tissue damage but may have to be combined with the patients' ability to produce and maintain a high level of antibodies against his own thyroid for a protracted period.

It is of interest that minor degrees of auto-immunisation are so common in thyrotoxic patients and that this coincides with the high concentration of complement-fixing antigen in the actively secreting thyroid epithelium. Delayed hypersensitivity phenomena have also been shown to be increased in certain thyroxine-treated animals whose behaviour in this respect is comparable to the human—viz., the guineapig and monkey (Long 1957). Though the clinical transition of thyrotoxicosis to Hashimoto's disease is rare, transient toxic symptoms have been noted frequently at the onset of lymphadenoid goitre (Vaux 1938), and it is possible that in the hypersensitive patient the auto-immune process overcomes an underlying mild hyperthyroidism before the patient is seen. It was also noted long ago that about 10% of thyrotoxic patients followed up for 10–15 years gradually became myxœdematous (Eason 1928)—a transition which is accelerated considerably when auto-immunised patients are submitted to thyroidectomy.

Apart from thyrotoxicosis, subacute thyroiditis of virus origin would appear to be the most probable condition giving rise to active auto-immunity with subsequent progressive tissue damage, though this cannot be proved at present. In some cases of myxœdema a history of neck pain with malaise several months before the onset of hypothyroidism has been elicited, and subclinical thyroiditis may have been overlooked. Further clinical study of the lymphadenoid process in its developing stages with the aid of serological tests should lead to better understanding of the factors underlying this lesion.

The coexistence of chronic thyroiditis with certain other diseases has been stressed; thus some patients with adrenal atrophy have an associated thyroiditis (Wells 1930), while some Hashimoto patients have nephrosis (Luxton 1957b), cirrhosis (Luxton and Cooke 1956), or Paget's disease (Luxton 1957a). Recent serological studies have shown that auto-immunity may be implicated in Addison's disease (Anderson et al. 1957) and in certain liver and kidney conditions as well as in the collagen diseases (Gajdusek 1958, Vorlaender 1957, Steffen 1957).

It is thus of interest that C.F. reactions with several human organs were found in a few Hashimoto patients from the present series, though the clinical and immunological significance of these observations is still unknown. It is conceivable that a single underlying agent, such as a virus, might initiate auto-immune phenomena in more than one organ, but the theoretical possibility remains that these cases are due to a disturbance of the mechanisms of immunological tolerance operating in normal health.

Summary

Methods for detection of thyroid autoantibodies by the agglutination of tanned cells coated with purified thyroglobulin and by the complement-fixation reaction using thyrotoxic thyroid gland are described.

The nature of the complement-fixing system has been studied and the antigen localised predominantly in the "microsome" fraction of thyroid homogenates. The complement-fixing antibody is distinct from that directed against thyroglobulin. The majority of patients with advanced thyroiditis had both thyroglobulin and complement-fixing antibodies, though these could be present independently.

Thyroid autoantibodies were demonstrated in 98% of Hashimoto patients, 83% of patients with spontaneous adult myxœdema, 64% of thyrotoxics, 33% of cases of non-toxic colloid goitre, 68% of patients with subacute thyroiditis, and 29% of thyroid malignancies. The highest antibody titres were found in Hashimoto's disease and myxœdema; in general, low titres were found in the other thyroid diseases, and the presence of antibodies was associated with localised lymphoid infiltration of the gland.

No tissue damage could be produced by Hashimoto sera either on passive transfer to a monkey or on addition to tissue-cultures of human thyroid.

We are extremely grateful to Mr. R. Vaughan Hudson, F.R.C.S., for his constant cooperation and support in this work and to Prof. F. Dickens and Prof. Sir Charles Dodds for their continued guidance and interest. It is a pleasure to acknowledge the kind hospitality of Prof. E. Witebsky and Dr. N. R. Rose, who taught one of us (I. M. R.) their hæmagglutination technique. Our thanks are due to Dr. R. G. White for his part in planning and carrying out the monkey experiment, to Mr. W. W. Richardson for the hemithyroidectomy, and to Prof. R. J. V. Pulvertaft and Dr. L. Weiss for the tissue-culture studies. We appreciate the help of the many colleagues who sent us sera for investigation. We thank Mr. K. Couchman, F.I.M.L.T., and Miss Pamela Wilson for their skilled technical assistance. The work was supported in part by a grant to the Medical School from the British Empire Cancer Campaign and by the Will Edmunds Fund of the Royal College of Physicians.

REFERENCES

Anderson, J. R., Goudie, R. B., Gray, K. G., Timbury, G. C. (1957) *Lancet*, i, 1123.
Bastenie, P. (1944) *Bull. Acad. roy. Méd. belg.* **9**, 179.
Belyavin, G. (1953) *J. Hyg., Camb.* **51**, 492.
Brent, L., Brown, J., Medawar, P. B. (1958) *Lancet*, ii, 561.
Collins, R. C. (1953) *Amer. J. Ophthal.* **36**, 150.
Colover, J., Glynn, L. E. (1958) *Immunology*, **1**, 172.
Cruickshank, B. (1958) *in* International Symposium on Immunopathology. Basle.
Derrien, Y., Michel, R., Roche, J. (1948) *Biochim. biophys. Acta*, **2**, 454.
Doniach, D., Roitt, I. M. (1957) *J. clin. Endocrin.* **17**, 1293.
— — (1958) *in* International Symposium on Immunopathology. Basle.
— — Vaughan Hudson, R. (1958) *Lancet*, ii, 265.
Donnelley, M. (1951) *Aust. J. exp. Biol. med. Sci.* **29**, 137.
Druez, G., Hainaut, J., Parmentier, R., Musin, L. (1958) *Acta clin. belg.* **13**, 280.
Dunhill, T. P. (1937) *Trans. med. Soc. Lond.* **60**, 2462.
Eason, J. (1928) *Edinb. med. J.* **35**, 169.
Eylan, E., Zmucky, R., Sheba, C. H. (1957) *Lancet*, i, 1062.
Felix-Davies, D. (1958) *ibid.* i, 880.
Flynn, F. V., de Mayo, P. (1951) *ibid.* ii, 225.
Freund, J., Lipton, M. M., Thompson, G. E. (1953) *J. exp. Med.* **97**, 711.
Gajdusek, D. C. (1958) *Arch. intern. Med.* **101**, 9.
Goudie, R. B., Anderson, J. R., Gray, K. G., Clark, D. H., Murray, I. P. C., McNicol, G. P. (1957) *Lancet*, ii, 976.
— — — (1958) *J. Path. Bact.* (in the press).
Greene, R. (1950) *J. Endocrin.* **7**, 1.
Kabat, E. A., Wolf, A., Bezer, A. E. (1947) *J. exp. Med.* **85**, 117.
Long, D. A. (1957) Ciba Colloquia on Endocrinology; vol. 10, p. 287. London.
Luxton, R. W. (1957a) *Lancet*, i, 441.
— (1957b) *Proc. R. Soc. Med.* **50**, 943.
— Cooke, R. T. (1956) *Lancet*, ii, 105.
Paine, J. R., Terplan, K., Rose, N. R., Witebsky, E., Egan, R. W. (1957) *Surgery*, **42**, 799.
Pulvertaft, R. J. V., Weiss, L., Davies, J. D., Wilkinson, J. H. (1958) *J. Path. Bact.* (in the press).
Roitt, I. M., Campbell, P. N., Doniach, D. (1958) *Biochem. J.* **69**, 248.
— Doniach, D. (1958a) *in* Henry Ford Symposium on Mechanism of Hypersensitivity. Detroit.
— — (1958b) Abstracts of Communications to IVth International Congress of Biochemistry, p. 194.
— — Campbell, P. N., Vaughan Hudson, R. (1956) *Lancet*, ii, 820.
Rose, N. R., Witebsky, E. (1956) *J. Immunol.* **76**, 417.
Schwentker, F. F., Rivers, T. M. (1934) *J. exp. Med.* **60**, 559.
Stavitsky, A. B. (1954) *J. Immunol.* **72**, 360.
Steffen, C. (1957) *Wien. Z. inn. Med.* **38**, 287.
Stuart, A. E., Allan, W. S. A. (1958) *Lancet*, ii, 47.
Trotter, W. R., Belyavin, G., Wadhams, A. (1957) *Proc. R. Soc. Med.* **50**, 961.
Vaux, D. M. (1938) *J. Path. Bact.* **46**, 441.
Vorlaender, K. O. (1957) *in* Immunopathologie in Klinik und Forschung (edited by P. Miescher and K. O. Vorlaender); chap. 5, 6, and 7. Stuttgart.
Waksman, B. H., Adams, R. D. (1955) *J. exp. Med.* **102**, 213.
Wasastjerna, C. (1958) Unpublished.
Wells, H. G. (1930) *Arch. Path.* **10**, 499.
White, R. G. (1957) *Proc. R. Soc. Med.* **50**, 953.
Whitesell, F. B., Black, B. M. (1949) *J. clin. Endocrin.* **9**, 1202.
Witebsky, E., Rose, N. R. (1956) *J. Immunol.* **76**, 408.
— — Shulman, S. (1958) *Lancet*, i, 808.
— — Terplan, K., Paine, J. R., Egan, R. W. (1957) *J. Amer. med. Ass.* **164**, 1339.

THYROID ANTIBODIES IN MYXŒDEMA

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THE presence of circulating autoantibodies to thyroglobulin in a majority of patients with Hashimoto's thyroiditis has been demonstrated by means of a precipitation-diffusion technique (Roitt et al. 1956, Doniach and Roitt 1957, Goudie et al. 1957, Trotter et al. 1957). It has been further noted that serum from occasional patients with idiopathic myxœdema also gives a positive precipitin reaction with human thyroid extract (Doniach and Roitt 1957, Goudie et al. 1957, Trotter et al. 1957).

In order to clarify the immunological relationship between non-goitrous myxœdema and Hashimoto's disease, we have investigated sera from patients with the two conditions, using an adaptation of Boyden's (1951) tannic-acid hæmagglutination technique. This method is considerably more sensitive than the precipitin test and allows quantitative comparison of antibody levels. A preliminary account of our results has already been given (Owen and Smart 1958).

Clinical Material

Sera were selected for inclusion in the present analysis by one of us (G. A. S.) from a total of over 500 which have been tested for thyroid antibodies. Selection was without reference to the immunological findings, on the basis of the clinical, laboratory, and pathological findings in the patients concerned. 78 patients with spontaneous, non-goitrous myxœdema formed the basis of the study. In all the diagnosis of primary myxœdema was considered to be beyond reasonable doubt. 18 of the patients were untreated at the time their sera were examined. The remainder had been taking thyroid extract for varying periods. The incidence and concentration of circulating thyroid antibody have been compared with those in the following two groups of patients:

1. 77 patients with Hashimoto's thyroiditis. This diagnosis was made or confirmed by histological examination in 51. In the remaining 26 the clinical and laboratory evidence for the diagnosis was considered strong. No case was included which did not present the typical combination of thyroid enlargement, clinical hypothyroidism, and disordered plasma-protein pattern. Patients in whom the diagnosis of Hashimoto's disease rested primarily on positive immunological findings have not been included. Of the 77, 15 had not been treated at the time of investigation, 33 had undergone partial thyroidectomy—usually followed by treatment with oral thyroid extract—and 28 had been treated with thyroid extract alone.

2. 52 hospital control patients, selected at random, the only condition of selection being the absence of symptoms or signs of thyroid disease.

Method

The level of circulating antibodies to thyroid protein was estimated by an adaptation of the tannic-acid hæmagglutination technique (Boyden 1951, Boyden and Sorkin 1955). This depends on the fact that erythrocytes, treated with a dilute solution of tannic acid, will adsorb proteins on to their surface and will subsequently agglutinate in the presence of antibody to the adsorbed protein. It is intended to publish full details of the present adaptation separately. The essential steps in the method were as follows:

1. Fresh sheep erythrocytes were washed several times with physiological saline solution, and a 2% suspension was made in saline solution buffered at pH 7·2. This was mixed with an equal volume of 1/37,500 tannic acid * solution in saline and allowed to stand for ten minutes at room temperature. The cells were gently centrifuged off, washed, and re-suspended in saline solution.

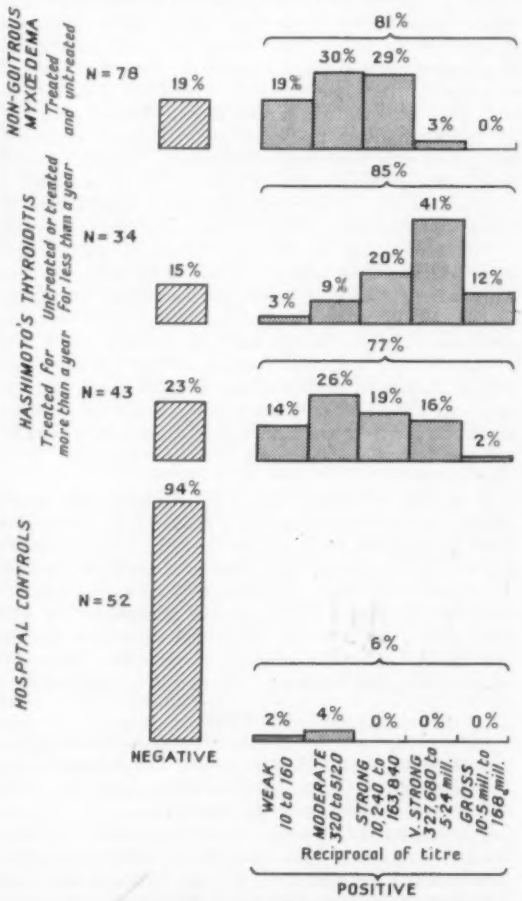
2. The tanned cells were then treated with an extract of human thyroid gland. This was made by homogenising part of a gland removed at operation from a thyrotoxic patient and centrifuging a 2% w/v homogenate at 12,000 r.p.m. for one hour at 0°C. A 1/10 dilution of the supernate in saline solution buffered at pH 6·4 was mixed with an equal volume of the 2% tanned cell suspension and allowed to stand for ten minutes at room temperature. After gentle centrifugation, the cells were washed twice in 1% normal rabbit serum in saline and re-suspended to 0·5% in the same medium.

3. Serial dilutions of test sera were made in 0·1 ml. aliquots of the tanned sensitised cell suspension, using small Durrum tubes ($1^1/_8$ in. × $^3/_{16}$ in.) placed at 45° to the horizontal in specially constructed 'Perspex' racks. 16 serial twofold dilutions, from 1 in 10 to 1 in 327,680, were made in the first place, higher dilutions being made subsequently when necessary. Results were read three to five hours after setting up, and the titre was recorded as the highest dilution at which there was complete agglutination of the cells (indicated by adherence of the cells to the tube walls).

Before use, the test sera and the normal rabbit serum were heated at 56°C for thirty minutes to inactivate complement, and absorbed against an equal volume of washed, packed sheep erythrocytes to remove possible non-specific agglutinins.

Results

63 (81%) of the patients with myxœdema had demonstrable circulating antibody to thyroid protein. In the



Incidence and concentration of circulating antibodies to thyroid protein in myxœdema, Hashimoto's disease, and patients without known thyroid disease.

* Reagent purity; obtained from Merck Sharp & Dohme Research Laboratories, West Point, Pa., U.S.A. (Lot 41353).

EFFECT OF TREATMENT WITH THYROID EXTRACT ON INCIDENCE AND CONCENTRATION OF CIRCULATING ANTIBODY TO THYROID PROTEIN IN PATIENTS WITH NON-GOITROUS MYXŒDEMA

—	Thyroid treatment and duration			
	None	<1 yr.	>1 yr. <3 yr.	>3 yr.
No. of patients	18	23	17	20
Circulating antibody demonstrated in	78%	83%	88%	75%
Mean antibody concentration*	9·0	10·0	9·6	7·3
S.E. of mean*	±1·1	±0·7	±0·8	±1·1

* In logarithmic units corresponding to number (N) of serial twofold dilutions of original 1 in 5 serum dilution. Reciprocal of titre: 5×2^N.

accompanying figure the distribution of antibody concentrations is summarised and compared with the corresponding results for Hashimoto's disease of recent origin and of long standing. The overall proportion of patients with Hashimoto's disease in whom thyroid antibody was demonstrated was not significantly different from that in the primary myxœdema cases, being 85% in the recent group and 77% in the longstanding group. There was, however, a highly significant difference in the level of circulating antibody between myxœdema and recent Hashimoto's disease (calculated mean titres respectively 1 in 2560 and 1 in 285,000, $P < 0{\cdot}001$). No such difference was apparent between myxœdema and Hashimoto's disease of long standing (mean titre 1 in 7760), the antibody distributions here closely resembling each other (see figure).

In the accompanying table the incidence and concentration of thyroid antibody in the 78 patients with primary myxœdema are classified according to the duration of treatment with thyroid extract. There was no significant difference between the treatment subgroups either in respect of the proportion of patients in whom antibody was demonstrable or in mean titre.

Hospital Control Patients

49 (94%) of the sera from hospital control patients gave negative results. The three exceptions were as follows:

Age (yr.)	*Sex*	*Diagnosis*	*Result*	*Titre*
42	F	Sinusitis	Weak positive	1 in 80
45	F	Iron-deficiency anæmia	Moderate ,,	1 in 1280
70	F	Pernicious anæmia	,, ,,	1 in 320

In none of these was there clinical or other evidence of thyroid disease.

Discussion

Our results suggest that, immunologically, the difference between non-goitrous myxœdema and Hashimoto's thyroiditis is only quantitative. Antibodies to thyroid protein are present with equal frequency—about 80%—in the two conditions. Their concentration is much higher in recent or untreated Hashimoto's disease, but this difference disappears after treatment by thyroidectomy or when regression of the goitre has been induced by a sufficiently long period of thyroid administration. It has already been established that the precipitin test in Hashimoto's thyroiditis usually becomes negative after thyroidectomy (Doniach and Roitt 1957). In our laboratory a hæmagglutination titre of 1 in 40,000 or higher is necessary in order to obtain a positive precipitin test (Owen and McLeod, unpublished observations based on 341 sera tested by the two methods in parallel). This greater sensitivity of the tannic-acid hæmagglutination technique reveals that after thyroidectomy the antibodies do not in general disappear, but are merely depressed to what we have now come to regard as myxœdema level, which is usually below the threshold for the precipitin reaction (see figure).

While it has not yet been possible to follow for long periods the effect of thyroid treatment on the antibody titre of individual myxœdematous patients, the present results suggest that little or no effect would be observed. Indeed, there seems no reason why replacement therapy with thyroid extract should have any direct influence on the level of antibody to thyroglobulin except where, as in Hashimoto's disease, it is possible by inhibiting secretion of pituitary thyroid-stimulating hormone to induce shrinkage of an enlarged thyroid gland and so to decrease the existing antigenic stimulus. In myxœdema little or no functioning thyroid tissue remains, and it may be assumed that the continuing antigenic stimulus is already minimal.

Our results support the suggestion of Doniach and Roitt (1957) that spontaneous myxœdema without goitre may be the end-result of thyroid auto-immunity. Pathological study of the thyroid gland remnants in myxœdema, which have usually shown histological changes resembling chronic thyroiditis (e.g., Douglass and Jacobson 1957), are in favour of such a unity between the basic mechanisms of myxœdema and Hashimoto's disease. The present findings shed no further light, however, on how or why the process of auto-immunisation is initiated. Moreover, the almost exclusive incidence of Hashimoto's disease in females remains unexplained.

Our failure to demonstrate circulating thyroid antibodies in 20% of patients with these conditions may not mean that auto-immunisation is not operating or has not operated in these cases. It is pertinent to recall that Rose and Witebsky (1956) were not able to detect such antibody in the circulation of every rabbit in which experimental auto-immune thyroiditis was successfully produced, despite the development of histological changes in the thyroid gland. It seems possible that, under certain circumstances, the antibody may remain entirely localised to the thyroid tissue.

The finding of thyroid antibody in 3 hospital control patients, all female, who had no symptoms or signs of thyroid disease, is perhaps not entirely unexpected in view of the high reported incidence of lymphadenoid changes in the thyroid glands of women in later life (Hazard 1955).

Summary

Using the sensitive tannic-acid hæmagglutination technique, antibodies to thyroid protein have been demonstrated in the circulation of four-fifths of a series of patients with ordinary non-goitrous myxœdema. An identical proportion of patients with Hashimoto's thyroiditis showed such antibodies.

Antibody levels were significantly higher in Hashimoto's disease when it was of recent origin; but when treatment by thyroidectomy or oral thyroid extract had been instituted more than a year previously, the value closely approximated to those found in primary myxœdema. These findings are taken to support the idea of a basic unity between the mechanisms of the two conditions.

In myxœdema the duration of treatment with thyroid extract appeared to have little or no effect on the level of circulating antibody.

We wish to thank the many physicians and surgeons who have allowed us access to their cases, and to acknowledge an especial debt to Dr. R. T. Cooke for his assistance and advice.

references overleaf

STAPHYLOCOCCAL DIARRHŒA

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SURGICAL REGISTRAR, ABERDEEN ROYAL INFIRMARY

IN this hospital group 8 cases of staphylococcal diarrhœa were recognised in four months. This incidence of a condition which is often fatal, and in most instances is the direct result of treatment, is all the more disturbing since there is no reason to suppose that it is at all exceptional. Staphylococcal infection was common in all the surgical wards, but certainly not of epidemic proportions, and the 8 cases of staphylococcal diarrhœa appeared sporadically in six different surgical units. Experience suggested that cases could be missed clinically and at necropsy or because of inadequate bacteriological examination of bowel secretions, fæces, or rectal swabs.

The term " staphylococcal diarrhœa " was recommended by Cook et al. (1957), who described outbreaks of epidemic proportions affecting one hospital. It seems likely that staphylococcal diarrhœa and pseudomembrane formation are not necessarily related conditions (Dearing and Heilman 1953). The cases of pseudomembranous enterocolitis reviewed by Penner and Druckermann (1948) and by Pettet et al. (1954) may be of different ætiology, but in neither series was there adequate laboratory investigation. The term " pseudomembranous enterocolitis " describes a pathological entity of non-specific ætiology and will be avoided: in the present series only 1 patient was shown at necropsy to have pseudomembrane formation. The existing confusion in nomenclature possibly reflects the lack of understanding of the pathology of the small bowel, and it certainly increases the difficulty of assessing the true incidence of staphylococcal diarrhœa.

Clinical Findings

Of the 8 cases 7 arose in the postoperative period, while the 8th followed a severe epistaxis which was treated by transfusion and postnasal pack. All 8 patients received antibiotics, and, as will be seen in table I, these were either a combination of penicillin and streptomycin, or a tetracycline. The cases fell into two groups, severe or moderate, according to the severity of the diarrhœa, and this influenced the prognosis. Among the 6 severe cases there were 5 deaths, and among the 2 moderate cases there was no death.

The 5 patients who died had, in addition to severe diarrhœa, high fever, hypotension of sudden onset, high pulse-rate, restlessness, and mental confusion. Abdominal symptoms and signs included distension with pain; increased bowel sounds, particularly in the early stages, thus mimicking intestinal obstruction; and diffuse tenderness. There was early evidence of loss of extracellular fluid with dry tongue, sunken facies, lax skin with poor venous filling, and great thirst. 3 of the fatalities were in good-risk cases who had given little anxiety. The 4th patient was in poor condition, though diarrhœa did not begin till the tenth postoperative day; while the 5th, an elderly man with bronchiectasis who had had severe epistaxis, had recovered from his hæmorrhage and was ambulant when diarrhœa began. Postoperative shock was not a common predisposing factor as it was in the series of Penner and Druckermann (1948) where the condition was probably different and no bacteriological examinations were made.

In 2 of the survivors the symptoms, which were milder, began when some additions had been made to the postoperative diet and a nasal tube had been dispensed with. There was little constitutional upset and the only treatment required was to stop the antibiotic. The 3rd survived only after massive transfusion and a course of erythromycin.

Illustrative Case-records

Case 2.—A fit man, aged 72, was admitted as an emergency with a short history of intestinal obstruction. At laparotomy a carcinoma of the transverse colon was resected by the Paul-Mikulicz technique. Systemic oxytetracycline to a total dose of 1·1 g. was given with one dose of a penicillin-streptomycin combination. On the third postoperative day the patient was restless with loose movements of his colostomy. His temperature rose to 103·6° F and he died next day. Shortly before death the colostomy movements were jelly-like. At necropsy swabs from jejunum, which showed a mucoid exudate, gave a heavy growth of a staphylococcus insensitive to penicillin, streptomycin, tetracycline, and chloramphenicol but sensitive to erythromycin. A similar organism was isolated from a case of infected burns in a patient who had been in the same ward for some time.

Case 5.—A fit man, aged 43, underwent right hemicolectomy for carcinoma. He contracted a wound infection which subsided, but on his twenty-fourth postoperative day, because of persistent fever, he was given a course of oral oxytetracycline to a total of 4·5 g. On the twenty-ninth postoperative day he was afebrile; but troublesome diarrhœa, with associated thirst, began. Cultures of rectal swabs gave a heavy growth of staphylococcus sensitive only to erythromycin, with no associated gram-negative bacilli. The antibiotic was stopped and by next day he had recovered. At this time he was eating well.

Case 8.—A fit man, aged 34, underwent vagotomy and pyloroplasty for recurrent dyspeptic symptoms six years after repair of hiatus hernia. He received 2·5 mega units penicillin and 5 g. streptomycin over the operative period. Early on the fourth postoperative day he collapsed and was resuscitated by transfusion. Diarrhœa with yellow watery fæces began before collapse and continued. Some time later he was noted to be hypotensive, with a pulse-rate of 150 and rising temperature. He was restless, disorientated, grossly dehydrated and seemed about to die. A gram-stained smear from a rectal swab showed a notable increase in coccal flora and many pus cells, with no gram-negative bacilli. Energetic treatment was begun with massive fluid replacement by dextran and saline. Erythromycin was given intravenously and by gastric tube. After eight hours, a total of 10·8 litres (19 pints) of intravenous fluid had been given. Blood-pressure was maintained at 110/70 mm. Hg, and the temperature had fallen from 104 to 97·2° F. Venous filling had improved, although the tongue was still shrunken. Transfusion was continued at a reduced rate, and a total of 13·4 litres (23½ pints) was given in the first twenty-four hours. By the following day, although profuse green diarrhœa continued, the patient's circulation was stable and he was oriented. He was able to drink freely and was given an intravenous supplement of approximately 3 litres per twenty-four hours for the next two days. Erythromycin 200 mg. six-hourly, potassium chloride, and tincture of opium were given orally. Further progress was uneventful although diarrhœa continued for four days. The urine contained much albumin for two days although a high specific gravity was maintained. Serum-potassium fell to 12·5 mg. per 100 ml. (3·2 mEq. per litre) by the second day; but, as the patient was eating and taking supplementary potassium by mouth, the deficit was rapidly made good. Examination of a rectal swab from the patient six weeks after his discharge from

DR. OWEN, PROF. SMART: REFERENCES

Boyden, S. V. (1951) *J. exp. Med.* **93**, 107.
— Sorkin, E. (1955) *J. Immunol.* **75**, 15.
Doniach, D., Roitt, I. M. (1957) *J. clin. Endocrin.* **17**, 1293.
Douglass, R. C., Jacobson, S. D. (1957) *ibid.* p. 1354.
Goudie, R. B., Anderson, J. R., Gray, K. G., Clark, D. H., Murray, I. P. C., McNichol, G. P. (1957) *Lancet*, ii, 976.
Hazard, J. B. (1955) *Amer. J. clin. Path.* **25**, 399.
Owen, S. G., Smart, G. A. (1958) Proceedings of the 52nd annual general meeting of the Association of Physicians of Great Britain and Ireland. *Quart. J. Med.* **27**, 563.
Roitt, I. M., Doniach, D., Campbell, P. N., Hudson, R. V. (1956) *Lancet*, ii, 820.
Rose, N. R., Witebsky, E. (1956) *J. Immunol.* **76**, 417.
Trotter, W. R., Belyavin, G., Wadhams, A. (1957) *Proc. R. Soc. Med.* **50**, 961.

TABLE I—SUMMARY OF 8 CASES OF STAPHYLOCOCCAL DIARRHŒA

Case no.	Age (yr.)	Sex	Diagnosis or operation	Operative risk	Onset of diarrhœa (days postop.)	Antibiotics administered	Resistance of faecal *Staph. aureus*	Chest lesion	Severity of case	Result
1	65	M	Sigmoid resection	Good	2	P, S	P, S, T	..	Severe	Died; pseudo-membrane present
2	72	M	Paul-Mikulicz resection of transverse colon	Good	3	T, P, S	P, S, T, C	..	Severe	Died
3	72	M	Epistaxis	Fair	6 after admission	P, S (E, P, T)	P, S, C, E	Bronchiectasis	Severe	Died
4	48	F	Thoracic repair hiatus hernia ..	Good	2	S, T (E)	P, S, T	Massive pulmonary collapse	Severe	Died
5	43	M	Rt hemicolectomy	Good	29	T	P, S, T, C	..	Moderate	Recovered
6	68	F	Ventral hernia	Good	3	P, S	P, S, T, C	..	Moderate	Recovered
7	78	M	Gastroenterostomy	Fair	10	P, S (E, P, C)	P, S, T	Bilateral bronchopneumonia	Severe	Died
8	34	M	Thoracic vagotomy, abdominal pyloroplasty	Good	3	P, S (E)	P, S, T	..	Severe	Recovered

P = penicillin. S = streptomycin. C = chloramphenicol. T = tetracyclines. E = erythromycin.
Antibiotics shown in parentheses are those given after onset of diarrhœa.

hospital showed that he was not a fæcal carrier of staphylococci.

Bacteriology

In all cases a profuse and preponderant growth of *Staph. aureus* was obtained from the patient's fæces, rectal swab, or (as in cases 1 and 2) postmortem jejunal contents. The organism was coagulase-positive and in every case resistant to the antibiotics that had been given. In 3 a similar organism was isolated from lung tissue at necropsy.

Gram-stained films of rectal swabs usually showed grossly abnormal flora with many pus cells and cocci, which sometimes were clumped. Gram-negative bacilli were absent; and the appearance was like that of a wound swab rather than the normal fæcal flora which contains cocci—including staphylococci, which are normally present in 17% of patients on admission to hospital (Brodie et al. 1956). In the 3 survivors daily rectal swabs showed that recolonisation by normal flora was rapid (table II). No attempt was made to speed this process by using lactobacilli or *Escherichia coli* preparations, but the patients were encouraged to eat as varied a diet as their condition allowed. On only one occasion were some gram-positive bacilli, resembling clostridia, noted on a slide when the coccal flora was being replaced.

In suspected cases the specimens were plated on blood-agar, plain agar, MacConkey's, and desoxycholate citrate agar media. A characteristic on a MacConkey's plate was the replacement of the normal flora by staphylococci. The sensitivity of the organisms was then determined. Experience showed that the diagnosis was often not obvious either clinically or at necropsy, where macroscopic appearances were often minimal, but was decided by bacteriological examination.

Discussion

The experience recorded here indicates that staphylococcal diarrhœa is common in surgical wards and can occur without a frank epidemic. It is characterised by a grossly abnormal fæcal flora with enormous numbers of staphylococci and pus cells and the virtual elimination of gram-negative bacilli and other organisms on direct film. Moreover, with an effective antibiotic, such as erythromycin, the staphylococci were rapidly eliminated from the fæces, the patient's temperature fell, and diarrhœa subsequently ceased. These findings do not constitute rigid proof of the causal relationship between staphylococci and the clinical condition, yet they offer strong presumptive evidence that the association is more than fortuitous. If the staphylococcus is not responsible for the condition, then we have to explain, in the absence of any other detectable pathogen, the polymorphonuclear exudate and the rapid response to specific therapy.

It is known that staphylococci are normally excreted in the fæces of some hospital patients (Brodie et al. 1956) and have also been found in a similar proportion of post-mortem gut specimens (Oeding and Austarheim 1954). This carrier state involves relatively few organisms and is quite different from the overwhelming preponderance of the organisms in the cases described here. I believe, therefore, that the condition is a specific infection, and, in view of the findings, I consider the term "staphylococcal diarrhœa" (Cook et al. 1957), justifiable. Infection was associated in some cases with the use of an intranasal gastric tube, and in 1 case with a postnasal pack, and possibly these determined the portal of entry. Pseudomembrane formation was found in only 1 of the fatal cases and was probably a non-specific response of an inflamed mucosa, since it is known to occur in other conditions (*Lancet* 1954).

In severe cases there were high initial temperatures ranging from 102·4 to 104°F (39–40°C); but the 2 cases of moderate severity had little constitutional upset. After operation a sharp rise in temperature, a tympanitic abdomen, a temporary increase in bowel sounds, and diarrhœa form a tetrad of clinical signs which strongly suggest staphylococcal diarrhœa. The postoperative patient appears to be especially liable to the condition,

TABLE II—ESTABLISHMENT OF NORMAL FLORA IN 3 SURVIVORS

Case no.	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
5	Pure culture staphylococci	Staphylococci preponderant; 6 colonies *Esch. coli*	Normal flora; 10 colonies staphylococci	..	..	..
6	Heavy growth staphylococci; few colonies *Esch. coli*	Pure culture staphylococci	Heavy growth staphylococci; faecal streptococci present	Staphylococci predominant; few colonies *Esch. coli*	Normal flora; very few staphylococci	..
8	Heavy growth staphylococci; few colonies *Esch. coli*	Pure culture staphylococci	Scanty growth staphylococci only	Normal flora; no staphylococci	Normal flora	Normal flora

although cases have been described in which operation was not undertaken (Choremis et al. 1954, Hay and McKenzie 1954), and 1 case in the present series was in this category. It seems likely that after operation the adynamic, dilated bowel, the restricted diet, and the presence of antibiotics produce conditions which are peculiarly suitable for colonisation by resistant environmental staphylococci. The resulting mucosal lesion, which in some respects is analogous to a partial-thickness burn, leads to failure of resorption of the alimentary secretions and also, probably, to the loss of large quantities of plasma-like fluid from the extracellular space. This requires energetic treatment by replacement of fluid. Thus case 8, after initial resuscitation, required infusion at the rate of 1 litre per hour for eight hours before circulation became stable, and even so he still displayed clinical signs of dehydration. In such severe cases the persistence of diarrhœa for some days, despite control of infection and shock, may be due to continued failure of a damaged mucosa to resorb fluid.

The treatment suggested for an established case of staphylococcal diarrhœa is therefore as follows:

1. The antibiotic in current use should be discontinued.

2. Vigorous fluid replacement should be begun and continued. A plasma expander, such as dextran, should be given immediately to raise blood-pressure. Infusion may then be continued with large volumes of saline and dextrose solutions alternately, at a rate of 1 litre per hour or faster if clinical response is poor, until the circulation is stable.

3. An appropriate antibiotic to combat the staphylococcal infection should be administered. In this hospital group where the policy has been to limit the use of erythromycin to such a contingency, this is still the drug of choice. Where environmental staphylococci are likely to be erythromycin-resistant, recourse may be made to novobiocin.

The use of vasopressor drugs can be justified only if fluid replacement is adequate. Lactobacillus preparations, although theoretically useful, do not seem to be of clinical value (Cook et al. 1957).

Prevention of the condition depends largely on the correct and critical use of antibiotics, which should be administered only on specific indications for established infections, and which have only limited value in prophylaxis (Webster 1958).

Summary

In the surgical wards of one hospital group 8 cases of staphylococcal diarrhœa occurred in four months, and 5 were fatal. There was no evidence of a staphylococcal epidemic at the time, and the cases came from six different units.

All 8 patients had had antibiotics, and in each case a profuse growth of antibiotic-resistant organisms was isolated from the bowel.

Early diagnosis and treatment is imperative in this lethal disease of hospital origin.

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REFERENCES

Brodie, J., Kerr, M. R., Sommerville, T. (1956) *Lancet*, i, 19.
Choremis, C., Tsengi, C., Economou-Mavrou, C. (1954) *ibid.* ii, 1236.
Cook, J., Elliott, C., Elliot-Smith, A., Frisby, B. R., Gardner, A. M. N. (1957) *Brit. med. J.* i, 542.
Dearing, W. H., Heilman, F. R. (1953) *Proc. Mayo Clin.* **28**, 121.
Hay, P., McKenzie, P. (1954) *Lancet*, i, 945.
Lancet (1954) ii, 228.
Oeding, P., Austarheim, K. (1954) *Acta path. microbiol. scand.* **35**, 473.
Penner, A., Druckermann, L. J. (1948) *Gastroenterology*, **11**, 478.
Pettet, J. D., Bagenstoss, A. H., Dearing, W. H., Judd, E. S. (1954) *Surg. Gynec. Obstet.* **98**, 546.
Webster, C. U. (1958) *J. R. Coll. Surg. Edinb.* **4**, 39.

MODIFICATION OF ACUTE REFLEX RESPONSES TO COLD BY BRIEF TRAINING IN COLD CLIMATE

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EVIDENCE has previously been reported (Keatinge and McCance 1957) that sudden exposure to cold water can produce a sharp increase in systemic venous pressure and probably pulmonary arterial pressure, as well as the better-known rise in systemic arterial pressure and inspiratory disturbance of respiration. The increase of blood-pressure and pulse-rate induced by immersing a hand in ice-water can be reduced by repeated immersions (Glaser and Whittow 1957), and the blood-flow in the arms of Eskimos (presumably cold-adapted) has been shown to decrease less rapidly than that of white subjects when the limbs were immersed in water at 10°C (Brown and Page 1952). These studies indicated that some responses to local cold can be reduced by repetition. The present experiments were carried out to find whether reflex cardiovascular and respiratory responses to a cold shower were altered by 10 days' training in a cold climate.

Procedure

The initial cold-shower experiment was carried out on the evening the subjects arrived at the hut near Bergen, Norway, at which they were based for the 10-day training-period. This was at an altitude of 1200 ft. For 2 hours before the experiment all subjects remained indoors and ate nothing more substantial than a biscuit. The experiments were performed in a shower-room whose temperature was maintained at 15·5–16·5°C by running hot showers.

Each subject first took a 5-minute hot shower and then sat unclothed on a wooden seat, perforated to allow water to drain away. He was quickly mopped dry, a pneumograph was fitted round his chest, a heat-flow disc was attached by ' Nobecutane ' to the pad of his left index finger, a thermocouple insulated by cotton-wool was fixed to the knuckle of this finger, and a blood-pressure cuff to his right arm. His left index finger was immersed to the level of the first interphalangeal joint in water at 17–18°C, which was stirred mechanically so that it flowed steadily over the finger. The skin temperature of the front of his chest was then measured with a stirrup thermocouple.

The pneumograph recording was then started, and measurements of heat loss from the finger, insulated skin temperature at the base of the finger, and blood-pressure were taken every minute. The first blood-pressure reading was ignored. After three readings had been taken an assistant turned the shower on to the subject, the spray being held 2 in. from him and the centre of it directed at the angle of his ribs, from which it ran down his abdomen and over his thighs. The water was left running continuously between experiments to ensure a stable temperature, and remained at 5–6°C. The flow-rate was 6 litres per min. and the spray was 3 in. across. The shower and the readings were continued for 4 min.

During each of the next 8 days the men were training outside between 9 A.M. and 5 P.M. A packed lunch was usually eaten outside, but on three occasions was eaten in the hut. For most of the time the men were taking vigorous exercise, but from time to time they spent several hours standing watching demonstrations or practising rifle shooting from skis. They took steam baths followed by a cold shower every evening. The remaining 2 days were spent on an exercise during which the unit spent a night in snowholes in the mountains and a further night skiing. During this time skin-temperature and

mouth-temperature readings were taken when there was an opportunity.

At the end of the 10 days' training the cold-shower experiment was repeated in the hut, again more than 2 hours after each subject had eaten a meal and had spent at least 2 hours in the warm.

Subjects and Methods

The subjects were 10 healthy men, members of a volunteer Territorial Army unit. All were aged 20–34 except subject 8 who was 42. Apart from subjects 4 and 8, who had been working out of doors most of the winter, all were sedentary workers and had not been unduly exposed to cold in the previous 3 months.

In the cold-shower experiments heat loss from fingers was measured by heat-flow discs (Hatfield 1949). Chest skin temperatures were measured by stirrup thermocouples of 28-gauge wire (Stoll and Hardy 1950), and arterial temperature at the base of the index finger was assessed by thermally insulated couples on the dorsum of the proximal interphalangeal joint (Keatinge 1957). The cold junction was in a vacuum flask of ice and water, and the E.M.F. led to a direct-reading galvanometer. Systolic and diastolic blood-pressure was measured by a cuff and auscultation of the brachial artery, and respiration was followed by a thoracic pneumograph at the level of the 3rd costochondral junction.

In the field skin temperatures, mouth temperatures, and air temperatures were measured by mercury thermometers. Air temperatures and humidities were measured by a whirling hydrometer and wind speeds by an anemometer.

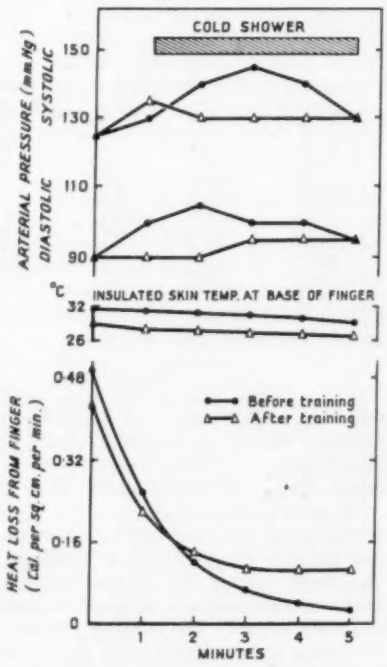

Fig. 1—Effect of cold shower on blood-pressure, finger arterial temperature, and finger heat loss of subject 7 before and after training period.

Results

Responses to the Cold Shower

Fig. 1 shows the effect of the cold shower on the blood-pressure, finger heat loss, and finger skin temperature of a representative subject, before and after the 10-day training period. The shower had less effect on his blood-pressure and finger heat loss after training than it did beforehand. Both his systolic and diastolic pressure rose a little just before the showers, probably because of apprehension.

Table I (top) shows the systolic blood-pressures of the subjects 1 minute before the shower, just before the shower, and the highest pressure reached during the shower. Table I (bottom) gives similar information about the diastolic pressures. The rise in blood-pressure is given on each occasion as the difference between the lowest of the two initial readings and the highest pressure reached during the shower. After training the systolic and diastolic pressures each rose less in 8 subjects, by the same amount in 1, and more in 1. The average increase in both systolic and diastolic pressures after the period of training was less than half as great as before it, and the alteration of both was significant.

Table II shows that the heat loss from the subjects' index fingers in stirred water fell considerably during both showers. After the training, however, the final rate of heat loss, expressed as a percentage of the initial rate of loss, was greater in every case and on average twice as great as before the training period. The alteration was highly significant. Moreover, the only 2 subjects who had been working out of doors during the winter maintained the heat loss from their fingers during the initial shower better than the other subjects. Table II also shows that the average rates of heat loss, the average chest skin temperatures, and the average insulated finger skin temperatures at the beginning of the shower were all very similar before and after training.

TABLE I—SYSTOLIC AND DIASTOLIC BLOOD-PRESSURES (MM. HG) OF THE SUBJECTS DURING THE COLD SHOWER

Subject	Before training				After training			
	1 min. before shower	Immediately before shower	Max. during shower	Rise	1 min. before shower	Immediately before shower	Max. during shower	Rise
Systolic:								
1	105	105	140	35	150	155	170	15
2	135	140	160	25	155	150	155	5
3	140	135	150	15	140	140	160	20
4	130	110	130	20	105	105	105	0
5	130	130	145	15	125	130	135	10
6	130	150	160	30	120	120	130	10
7	125	130	145	20	125	135	130	5
8	130	125	165	35	140	135	145	10
9	140	140	160	20	140	145	150	10
10	140	140	150	10	140	145	150	10
Means	130·5	130·5	150·5	22·5	134·0	136·0	143	9·5
	For individual change in response C = 0·74, P < 0·005							
Diastolic:								
1	80	80	110	30	100	100	105	5
2	100	95	110	15	90	90	95	5
3	100	100	100	0	90	90	100	10
4	90	90	90	0	80	80	80	0
5	85	90	100	15	75	65	70	5
6	90	90	105	15	90	90	100	10
7	90	100	105	15	90	90	95	5
8	90	95	105	15	90	90	90	0
9	100	100	110	10	100	100	100	0
10	100	100	110	10	100	95	95	0
Means	92·5	94·0	104·5	12·5	90·5	89·0	93·0	4·0
	For individual change in response C = 1·08, P < 0·025.							

TABLE II—THE RATES OF HEAT LOSS FROM THE SUBJECTS' FINGERS BEFORE AND AFTER THE COLD SHOWERS, AND THE SKIN TEMPERATURE ON THE CHEST AND AT THE BASE OF THE INDEX FINGER BEFORE THE SHOWER

Subject	Before training					After training				
	Rate of heat loss from finger			Skin temp. of chest (°C)	Insulated skin temp. of index finger (°C)	Rate of heat loss from finger			Skin temp. of chest (°C)	Insulated skin temp. of index finger (°C)
	Just before shower*	At end of shower*	Final as % of initial			Just before shower*	At end of shower*	Final as % of initial		
1	0·2045	0·01704	8·3	30·2	27·0	0·0767	0·01536	20·0	29·9	26·6
2	0·1022	0·00680	6·7	28·5	27·4	0·2045	0·04600	22·5	32·6	30·0
3	0·2028	0·01704	8·4	27·8	30·3	0·1449	0·02976	20·5	28·2	25·4
4	0·2556	0·03752	14·7	28·2	32·4	0·1874	0·03576	19·1	31·4	30·2
5	0·1721	0·04600	26·7	33·0	30·0	0·2351	0·10744	45·7	32·1	29·7
6	0·2079	0·01363	6·6	31·7	27·5	0·2062	0·02552	12·4	32·0	23·1
7	0·2556	0·02556	10·0	32·3	30·8	0·2181	0·10224	46·9	28·4	27·7
8	0·3408	0·05960	17·5	30·8	30·7	0·2420	0·05792	23·9	30·3	28·6
9	0·2386	0·02048	8·6	30·6	28·1	0·2931	0·03920	13·4	32·1	29·7
10	0·1738	0·01024	5·9	29·1	25·2	0·1534	0·01704	11·1	28·8	28·8
Means	0·2154	0·02539	11·3	30·2	28·9	0·1961	0·04762	23·6	30·6	28·0

* cal. per sq. cm. per min.
For individual change in final rate of heat loss (as % of initial rate), $C = 0{\cdot}82$, $P < 0{\cdot}005$.

The respiratory rate sometimes increased and sometimes fell under the cold shower, the only consistent alteration in respiration being an increase in depth, which was often of brief duration. Fig. 2 shows the kymograph records of 2 men in whom the respiratory response was considerably less after the training period. In most cases there was little improvement, and in 2 the respiratory response was greater after training. The average increase during the second shower was only about 20% less than during the first, and the alteration was not significant.

Subjective Sensations

Most subjects appeared to be more apprehensive before the second shower than before the first. This was particularly true of subject 3, who differed from the others in showing a larger increase in systolic and diastolic blood-pressure and in depth of respiration on the second occasion than on the first. After the second shower, however, most men volunteered the information that they found it less unpleasant than before the training period.

Observations in the Field

Finger temperatures were usually high—of the order 25–32°C—but sometimes fell to 0–6°C after the men had been standing in cold winds, or eating meals outside. Mouth temperatures taken on the same subject at short intervals often differed widely. Under some conditions mouth temperatures may give a more satisfactory index of deep body temperature than rectal readings (Pickering 1958), but in our experience were unreliable with people breathing cold air. However, since no-one underwent spells of severe or long-continued shivering it is unlikely that any ever became seriously chilled. The weather was sunny throughout, with shade temperatures of −10–0°C and winds of 0–15 m.p.h. Temperatures in the snowholes were 3–6°C wet and dry bulb, although the outside temperature fell to −9·5°C during the night.

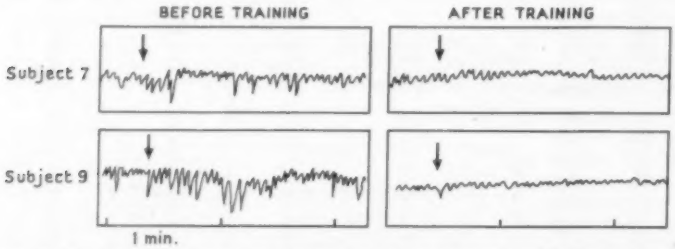

Fig. 2—Effect of cold shower on respiration of subjects 7 and 9 before and after training period. (Down-strokes = inspiration.)

Discussion

It is clear that most subjects gave considerably smaller reflex responses to the cold shower after the period of training. This is most strikingly shown by the heat losses from their fingers, which were in every case better maintained during the second shower than during the first. Changes in blood-pressure were also significantly smaller on the second occasion, but the alteration in the respiratory response to the shower was small and not significant. The irregularity of the respiratory change may be due largely to the ease with which respiration is affected by voluntary control. The reduced response after the period of training did not appear to be due to diminished apprehension; before the second shower the men appeared on the whole more rather than less apprehensive and their initial systolic blood-pressures were on average somewhat higher than before the first. Since the average skin temperatures of the chest, skin temperatures at the base of the finger, and heat losses from the fingers were very similar on the two occasions, the reduction in response on the second occasion cannot have been due to an initial difference in the temperature of the skin area stimulated by the shower, or of the finger from which measurements of heat loss were made.

The reductions in the men's reflex responses to the cold shower may be entirely a result of habituation in the central nervous system as postulated by Glaser and Whittow (1957) for repeated exposure of a hand to ice water. However, retained adaptation in the sense-organs might play a part, while an alteration in the blood-vessels themselves could contribute to the reduced vasoconstriction and blood-pressure response; sense organs show fatigue on repeated stimulation (Adrian et al. 1931), and there is evidence that the arteries of pigs and rats respond less to adrenaline when the animals are acclimatised to cold (Desmarais and Dugal 1951, Smith 1953). It seems impossible to say which factor was responsible for the adaptation seen in these experiments; all may have played a part. Nor is it possible to say whether the change was entirely due to repeated exposure to cold, or whether cardiovascular adjustments associated with prolonged physical exercise during the training period also played a part in altering responses to the shower.

The reduced reflex responses to cold would be advantageous in that sudden immersion in cold water would presumably incapacitate the men less and perhaps be

less dangerous after the training period. Their improved ability to maintain blood-flow in their fingers during exposure to cold would also presumably make them less liable to frostbite. However, the fact that their physiological mechanisms for reducing heat loss were brought into action less rapidly after training implies that they would lose more heat during a brief exposure to cold.

Summary

The effect of a cold shower on the respiration, blood-pressure, and finger blood-flow of 10 men was studied before and after they underwent a 10-day period of training in snow-covered, mountainous country.

After the training period finger blood-flows were better maintained in every case, and the men's blood-pressures rose on average less than half as much as before training. Their respiration deepened on average about 20% less during the second shower than during the first.

These changes are probably advantageous in that they reduce both the immediate hazards of sudden immersion in cold water and the danger of frostbite in cold air, but disadvantageous in that they increase the amount of heat lost from the body.

We are grateful to Prof. R. A. McCance for his support; to Major J. M. Woodhouse for permission to carry out the experiments; to other members of the 21st S.A.S. Regiment for their cooperation as subjects; and to Colonel H. Risnes and other members of the Norwegian Home Guard for providing facilities in Norway.

REFERENCES

Adrian, E. D., Cattell, McK., Hoagland, H. (1931) *J. Physiol.* **72**, 377.
Brown, G. M., Page, J. (1952) *J. appl. Physiol.* **5**, 221.
Desmarais, A., Dugal, J. P. (1951) *Canad. J. med. Sci.* **29**, 90.
Glaser, E. M., Whittow, G. C. (1957) *J. Physiol.* **136**, 98.
Hatfield, H. F. (1949) *ibid.* **111**, 10P.
Keatinge, W. R. (1957) *ibid.* **139**, 497.
— McCance, R. A. (1957) *Lancet*, ii, 208.
Pickering, G. W. (1958) *ibid.* i, 1.
Smith, D. J. (1953) *Amer. J. Physiol.* **172**, 118.
Stoll, A. M., Hardy, J. O. (1950) *J. appl. Physiol.* **2**, 531.

LEPTOSPIRA BALLUM IN SMALL RODENTS IN SCOTLAND

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HITHERTO the only serotypes of leptospires isolated and identified in Britain have been *Leptospira icterohæmorrhagiæ* and *Lepto. canicola*. No serological evidence of human infection with other serotypes was found by Broom (1951), who tested samples of serum from 642 cases of aseptic meningitis, but Michna (1958) reported finding agglutinins for *Lepto. pomona* in a high proportion of sera from pigs in Scotland.

More than a dozen serotypes have been recognised on the Continent of Europe; and in many cases the reservoir hosts, which are mainly small rodents, are either the same as, or closely related to, the muridæ found in Britain. Surveys of infection-rates in rats have been made in this country, but, of the smaller rodents, only *Apodemus sylvaticus* has been investigated. Elton, Ford, Baker, and Gardner (1931) trapped 356 of these mice near Oxford, and demonstrated leptospires in kidney suspensions of 29 by microscopical examination. They failed, however, to isolate any strains in culture; so the identity of the leptospires was not established. We therefore decided to take advantage of an opportunity of carrying out a limited survey among small rodents in the environs of Edinburgh.

Trapping Sites and Technique

122 of the 162 rodents which we examined were caught in the grounds of Bush House. This estate lies eight miles south of Edinburgh and belongs to the university's School of agriculture. That part of the estate where we set the traps consists of parkland, woods, plantations, and grass fields, thus providing the various environments in which the three species of wild mice, *Apodemus sylvaticus* (wood mouse), *Microtus hirtus* (field vole), and *Clethrionomys glareolus* (bank vole) are found.

Many of the field voles were trapped in a spinney of young fir trees, in an area fenced off from grazing animals, so that there was much undergrowth and the mouse runs were easily discovered by folding back the long grass through which they tunnelled. The traps* were filled with fresh green grass, baited with corn, and placed in the runs. We found that, when food and moisture were provided in this way, the mice remained alive even when the traps could not be examined until late in the day. Bank voles were caught among gorse bushes on an open piece of rough ground, and wood mice around the base of the trees in a beech plantation bordering it. In order to examine mice from as many localities as possible we moved the traps to different parts of the estate where conditions were similar to those described.

In addition, a number of wood mice were caught in wooded areas on two other estates near Edinburgh and in the grounds of the students' halls of residence within the city. Specimens of *Mus musculus* (house mouse) were trapped around the kennels on the Bush Estate, on two Edinburgh piggeries, and in the meat market.

Material and Methods

The total number of rodents examined was 162, and comprised 66 wood mice, 45 field voles, 25 bank voles, 25 house mice, and 1 brown rat (*Rattus norvegicus*). The animals were trapped alive and brought to the laboratory where heart-blood was taken for agglutination tests, and two cultures from the kidneys of each animal were made in Korthof's medium.

In the serological examinations, a preliminary screening test was made using a 1/30 dilution of serum and 7 serotypes of leptospires—namely, *ballum*, *bataviæ*, *canicola*, *grippotyphosa*, *icterohæmorrhagiæ*, *pomona*, and *sejroe*. The actual titres of any sera which gave positive reactions were then determined in the usual way. The cultures were incubated at 30°C and examined microscopically at intervals for signs of growth. In the early part of the investigation, cultures were discarded if they showed no growth after one month. Experience showed, however, that strains isolated from these mice were often extremely slow in developing, so later we retained cultures for three months before finally considering them negative.

Results

Serological.—As the table shows, sera of 8 of the rodents had agglutinin titres of 1/30 or more. It will be seen that the rat serum agglutinated *Lepto. icterohæmorrhagiæ*, that all the positive mouse sera reacted with *sejroe*, and that one serum also agglutinated *bataviæ* and another *grippotyphosa*. None of the sera agglutinated any of the other serotypes.

Kidney culture.—Strains of leptospires were isolated in culture from 3 *Apodemus sylvaticus*, 5 *Microtus hirtus*, 7 *Clethrionomys glareolus*, and 1 *Rattus norvegicus*. As was to be expected from the serological result, the rat strain proved to be *Lepto. icterohæmorrhagiæ*. Strains from two wood mice, one field vole and one bank vole were identified as *Lepto. ballum*. This serotype was first isolated from *Mus musculus* sp. in Denmark by Borg-Petersen (1944) and has since been found in various species of rodents including laboratory mice. Sporadic cases of human

* 'Longworth' small-mammal traps made by Longworth Scientific Instrument Co., Thames Street, Abingdon, Berkshire.

CULTURAL AND SEROLOGICAL FINDINGS IN 162 SMALL RODENTS

Animal	No. examined	Positive kidney cultures		Positive agglutinins	
		Mouse no.	Identification	Mouse no.	Serotype and serum titre
Apodemus sylvaticus	66			A77	*sejroe* 30, *bataviæ* 100
				A82	*sejroe* 300, *grippotyphosa* 30
		A83	*ballum*		
		A87	*ballum*		
		A129	D	A129	*sejroe* 100
Microtus hirtus	45			M36	*sejroe* 30
		M72	*sejroe*/*saxkoebing* group		
		M104	*ballum*		
		M133	D		
		M135	*sejroe*/*saxkoebing* group		
		M158	*sejroe*/*saxkoebing* group		
Clethrionomys glareolus	25	V70	*sejroe*/*saxkoebing* group	V70	*sejroe* 100
		V116	*ballum*		
		V120	Not yet identified		
		V123	*sejroe*/*saxkoebing* group		
		V124	Not yet identified		
		V126	*sejroe*/*saxkoebing* group	V126	*sejroe* 100
		V130	D		
Mus musculus	25			H41	*sejroe* 30
Rattus norvegicus	1	R125	*icterohæmorrhagiæ*	R125	*icterohæmorrhagiæ* 3000
Totals	162	16		8	

D = Strain died out before identification.

infection occur in persons handling infected mice, but quite extensive outbreaks of leptospirosis due to *Lepto. ballum* were reported among ricefield workers in the deltas of the Ebro by Covaleda, Pumarola, and Canterell in 1953 and the Rhone by Picard in 1954. No human cases have yet come to light in Britain.

6 other strains (3 field vole and 3 bank vole) are closely related serologically to *Lepto. sejroe* and *Lepto. saxkoebing* but do not appear to be identical with either. The antigenic constitution of these strains is still under investigation. 3 of the remaining strains died out before they could be typed, and the other 2 have so far failed to provide cultures rich enough for use in serological tests for their identification.

Comment

Since strains related to *Lepto. sejroe* were isolated from 6 mice, it seems likely that the presence of agglutinins for that serotype in the sera of other mice may be regarded as evidence of infection with leptospires belonging to the same serogroup. The significance of the positive reactions with *Lepto. bataviæ* and *Lepto. grippotyphosa* must remain a matter of conjecture unless definite proof of the presence of these serotypes in Britain is found later.

It is interesting to note that, of the 15 mice from which strains were isolated, only 3 (A129, V70, V126) had agglutinins in their sera, and that no antibodies for *Lepto. ballum* were detected even in the mice harbouring the organism in their kidneys (see table). It is apparent therefore that serological surveys may give a misleading picture of the prevalence of leptospirosis, at least as far as small rodents are concerned.

Summary

The first isolation of *Leptospira ballum* in Britain is reported. Strains were cultured from 2 *Apodemus sylvaticus* (wood mouse), 1 *Microtus hirtus* (field vole), and 1 *Clethrionomys glareolus* (bank vole). Six strains isolated from the field vole and the bank vole are related to *Lepto. sejroe* and *Lepto. saxkoebing*, but are probably not identical with either. The sera of 7 out of 162 small rodents contained agglutinins for *Lepto. sejroe*. One of these sera also agglutinated *Lepto. bataviæ* and a second *Lepto. grippotyphosa*.

Our thanks are due to Prof. M. M. Swann and Mr. J. Godfrey of the Zoology Department at Edinburgh for lending the traps and supplying the first 15 specimens of apodemus; to Prof. S. J. Watson of the School of Agriculture for permission to set the traps on the Bush Estate; to Mr. C. A. Valentine and Mr. D. Ewart for the great help they gave in setting and examining the traps on the Bush Estate; and to Miss Joan Messum and Mr. R. J. Reed for the care they lavished on these recalcitrant strains.

REFERENCES

Borg-Petersen, C. (1944) *Acta path. microbiol. scand.* **21**, 504.
Broom, J. C. (1951) *Brit. med. J.* ii, 689.
Covaleda, J., Pumarola, A., Cantarell, I. (1953) *Rev. iber. Parasit.* **13**, 289.
Elton, C., Ford, E. B., Baker, J. R., Gardner, A. D. (1931) *Proc. zool. Soc. Lond.* 657.
Michna, S. W. (1958) *Vet. Rec.* **70**, 80.
Picard, J. (1954) *Bull. Acad. nat. Méd.* **138**, 190.

THE INTEGRITY OF SURGICAL GLOVES TESTED DURING USE

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SURGICAL rubber gloves should present an impermeable barrier to the bacteria on the skin. This is especially important in lengthy operations where a high temperature causes considerable sweating under the gloves. The sweat is laden with bacteria from the deeper parts of the sweat-ducts and is a potential source of postoperative infection, especially staphylococcal.

Because of their composition, gloves stand heat sterilisation poorly and tend to become less elastic. Such gloves are more liable to tear and are often relegated to the more junior members of the surgical team. In general gloves are tested after use, but not again after sterilisation, nor at any point during the operation. Recently a small series of tests were made on gloves used in a neurosurgical unit. Of 128 gloves examined, 21 showed one or more holes. The surgeon had fewer perforated gloves than his juniors

There was, we concluded, a need for a method of testing the integrity of gloves, at any time, without impairing their sterility—a method which could be used both before

operation and while operation was in progress. After some experiments with dyes and chemicals we decided on a method based on the insulating property of rubber. If a glove is perforated, fluid will escape (or enter) through the hole; and if (like sweat) this fluid is a good conductor of electricity such perforation will rob the glove of its insulating properties.

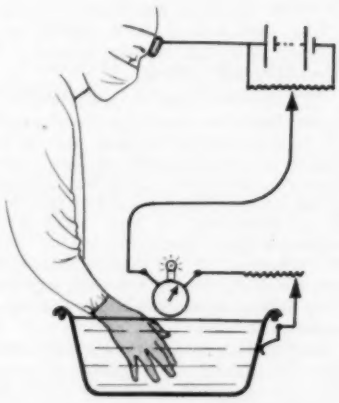
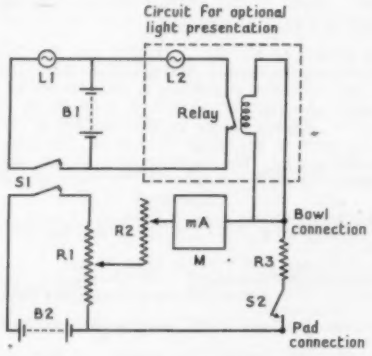


Fig. 1—The machine in use.

An electrical circuit is provided with two terminals, one a pad of moistened cotton gauze, the other a heat-sterilised stainless-steel bowl containing a mixture of sterile saline and 1% chlorhexidine ('Hibitane') solution (fig. 1). To test a glove, contact is made between the skin (usually the forehead or cheek) and the gauze pad, and then each gloved hand is dipped vertically into the bowl. If there is a perforation, a current will flow between the two electrodes, and this can be made to operate an indicator system, such as a warning light (figs. 1 and 2). The voltage in the circuit can be so low that most people do not detect it.

The chlorhexidine in the saline solution ensures that any bacteria which do leak out are killed and do not infect the gloves of the next user. Since the stainless-steel bowl is detachable, a spare may be kept in readiness if heavy infection is suspected. To ensure the machine is in working order, a shorting switch is provided. This mimics the person with a perforated glove, and can be used to show new users the response to be expected.



KEY TO FIG. 2

L1 and L2	6V 0.04A bulb	Ever Ready
B1	6V battery 996	Ever Ready
B2	45V battery B1068	Ever Ready
Relay	Moving-coil type no. 416	Electro Methods
S1	D/P S/T switch	Bulgin
S2	Push-button	
M	200 ohm 10mA meter	Victoria Instruments
R1 and R2	100K wire-wound potentiometer	
R3	22K carbon resistor	

NOTE.—The complete apparatus is to be manufactured by The London Hospital (Ligature Department) Ltd.

There are two possible causes of a false positive result. One is plunging the hand in obliquely, so that the saline floods over the top of the glove and makes contact with the arm. The other is moisture on the forearm, gown, and glove, which may form a water bridge through which a current may flow. This can be avoided by drying the cuffs of the gloves with a sterile towel.

In testing this machine, gloves with graded perforations were used and even the smallest puncture was detected with ease. Since then the method has been successfully tried in the operating-theatre.

It is a pleasure to thank the workshop at Guy's Hospital Medical School for their help in making this machine, and the photographic department for preparing the illustration. We are indebted to our surgical colleagues who interrupted their routine to test the method.

TYPHOID FEVER WITH VULVOVAGINITIS

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Now that typhoid fever is relatively rare in this country, genital ulceration as a complication is no longer mentioned in textbooks. It was well recognised fifty years ago. Keen (1898) described 17 cases and Lartigan (1899) another 2. Curschmann (1902) said that the condition was not uncommon and also described a form of "non-gonorrhœal leucorrhœa occurring with considerable frequency during typhoid".

The following cases follow closely the original descriptions and appear to be the first reported in Britain for some years.

Case-reports

Case 1.—A schoolgirl aged 15 was admitted to Chelsea Hospital for Women on Sept. 19, 1957, with a diagnosis of vulvovaginitis, possibly of venereal origin. Ten days previously she had returned from holiday in France. Four days before admission she felt feverish and had a headache; and two days after this she had noticed soreness of the vulva especially on passing urine. There had been no rash.

On admission her temperature was 100·6°F and her pulse-rate 100 per min. The spleen was just palpable, but there was no other abnormality on general examination. The inner margins of both labia minora were reddened and œdematous and were covered by a seropurulent exudate. Through this could be seen a number of oval superficial ulcers, the floors of which were covered by a yellowish membrane (see figure). There was no urethritis and no lymphadenitis, and the hymen was intact. The ulcers were extremely painful.

Investigations.—Direct smears from the ulcers showed a number of squamous cells and very little pus. There was a mixed flora of organisms including monilia, diphtheroids, and some gram-negative bacilli which were not further indentified. There was no serological evidence of syphilis. The hæmoglobin was 13·6 g. per 100 ml., the white-cell count 6150 per c.mm. (neutrophil polymorphs 64%, lymphocytes 32%, monocytes 2%, eosinophils 2%), and the erythrocyte sedimentation-rate 46 mm. (Wintrobe). Eighteen hours after admission she developed profuse diarrhœa and *Salmonella typhi* was cultured from the stool, from the blood, and also from the swab of the ulcers.

Treatment and progress.—On Sept. 23 she was transferred to the Western Fever Hospital and treated with chloramphenicol. The ulcers were completely healed by Oct. 2, two weeks after the original admission. She subsequently had a relapse with

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Superficial ulcers covered by a yellowish membrane.

positive stool-culture but no vulval ulceration; but she was eventually discharged well, after further treatment with chloramphenicol.

Case 2.—A single woman aged 21 returned to England in May, 1956, from Italy where she had been working as a dancer. She was admitted to Westminster Hospital on May 28 as a case of salpingitis. For four days she had had attacks of sweating, abdominal discomfort, vomiting, and vaginal discharge. Her periods had been irregular for six months since a febrile illness in December, 1955.

On admission she was very ill. Her temperature was 104°F, her pulse-rate 70 per min., and her respirations 20 per min. She was tender in the lower abdomen, and, on vaginal examination, very tender in the lateral fornices. There was considerable vaginal discharge and inflammation of the vaginal walls but no ulceration. There were no other positive findings.

Investigations.—Her hæmoglobin was 13·6 g. per 100 ml., and her white-cell count 9000 per c.mm. (neutrophil polymorphs 86%, lymphocytes 5%, monocytes 6%). A vaginal swab showed *Trichomonas vaginalis*, but no salmonella was cultured. Blood-culture was positive for *S. typhi* on June 1, and stool-culture was also positive on several occasions.

Treatment and progress.—She responded to chloramphenicol and was afebrile by June 18. There was no further vaginal discharge despite a relapse of the typhoid which was treated with oxytetracycline.

Discussion

The first case presented as a vulvitis; the second was diagnosed as vaginitis and salpingitis. Both patients had recently returned from the Continent, and in both of them the genital condition preceded the diarrhœa or any other symptom of typhoid infection. Neither patient had been immunised against typhoid before travelling abroad.

The second patient had the leucorrhœa of acute vaginitis. The fact that the vaginitis cleared up concurrently with the typhoid fever suggests a close association between the two conditions.

The vulval lesions of the first patients were identical with those known as ulcus acutum vulvæ—a condition first described by Neumann in 1895 but elaborated between 1904 and 1913 in a series of papers by Lipschütz whose name they bear. Characteristically such ulcers affect young women, usually virgins, and they are often associated with a febrile illness (Lipschütz 1913, Chevallier 1932). In a striking proportion of reported cases this illness has been typhoid fever (Berlin 1939, Brule et al. 1932, Buchman 1955, Planner and Remenovsky 1922, Sedallian et al. 1950, Troisier et al. 1934). Rosenthal (1930) described 4 cases during an epidemic of paratyphoid in Minsk, and the second of Lipschütz's original cases also had typhoid.

The ulcers are most commonly attributed to a local infection by the *Bacillus crassus* and to the lowered resistance of the skin of the vulva or vagina. This view is based on the common finding of large numbers of these organisms in the ulcers. However, when the bacillus was cultured by Scherber (1919) it was shown to be identical with the Döderlein bacillus which is non-pathogenic to man. Lipschütz believed that the organism might undergo mutation. Most attempts to prove its pathogenicity have failed, though Troisier et al. (1934) inoculated a guineapig with scrapings from an ulcer and were then able to obtain the bacillus in large numbers from the resulting exudate.

On the other hand, several workers have grown *S. typhi* from the ulcers complicating typhoid (Lartigan 1899, Planner and Remenovsky 1922, Zannerelli 1935) while Ducamp et al. (1923) isolated the organism from the vaginal discharge in four cases very similar to our case 2. The suggestion that this may be due to contamination by fæces or urine is difficult to disprove, but in both our cases the genital lesion preceded the diarrhœa.

In typhoid ulcers the most likely mode of infection appears to be by embolism; this is well recognised in typhoid fever as the cause of the roseate rash and of the bone and joint manifestations.

There seems to be little doubt that the condition described as ulcus acutum vulvæ is identical with that seen as a complication of typhoid fever, but it is uncertain whether typhoid is the only possible cause.

In our view the acute ulceration should be regarded as symptomatic of some general illness—with enteric fever high on the list—and no case should be diagnosed as "Lipschütz ulcer" until such possible underlying diseases have been excluded.

The lesion is of some forensic importance: though it affects mainly virgins both our cases were first diagnosed as possibly venereal.

Summary

Two cases of typhoid fever are described in which the first symptoms were vulvitis and vaginitis respectively.

The relationship of ulcus acutum vulvæ to typhoid is discussed. Such ulcers should always be regarded as symptoms of a general disease.

We are grateful to Mr. A. C. H. Bell and Mr. Briant Evans, under whose care the patients were admitted, for their encouragement and for permission to publish; to Dr. Howlett Kelleher, who treated case 1 after transfer, and Dr. R. I. S. Bayliss who treated case 2; to Dr. Magnus Haines for the pathological investigations; and to the staff at the Royal Society of Medicine for help with the bibliography. We are indebted to Mr. A. Bailey for the photographs.

REFERENCES

Berlin, C. (1939) *Arch. Derm. Syph., N.Y.* **39,** 89.
Brule, M., Hillemend, P., Gilbrin, E. (1932) *Bull. Soc. méd. Hôp. Paris,* p. 525.
Buchman, M. I. (1955) *Amer. J. Obstet. Gynec.* **70,** 435.
Chevallier, P. (1932) *Pr. méd.* **40,** 98.
Curschmann, H. (1902) *in* Nothnagel's Encyclopædia of Practical Medicine; p. 196. Philadelphia.
Ducamp, Gueit, and Pages (1923) *Bull. Soc. Sci. méd. biol. Montpellier* **5,** 207.
Keen, W. W. (1898) Surgical Complications and Sequelæ of Typhoid Fever; p. 78. Philadelphia.
Lartigan, A. J. (1899) *Boston med. surg. J.* **141,** 239.
Lipschütz, B. (1913) *Arch. Derm. Syph., Wien,* **114,** 363.
— (1918) *Wien. klin. Wschr.* **31,** 461.
Neumann, —. (1895) Quoted by Chevallier.
Planner, E., Remenovsky, F. (1922) *Arch. Derm. Syph., Berlin,* **140,** 162.
Rosenthal, S. K. (1930) *ibid.* **162,** 95.
Scherber, G. (1919) *Arch. Derm. Syph., Wien,* **127,** 259.
Sedallian, P., Monnet, P., Moinecourt, J. (1950) *Pr. méd.* **58,** 1445.
Troisier, J., Bariety, M., Gabriel, P. (1934) *Bull. Soc. méd. Hôp. Paris,* **50,** 1595.
Zannerelli, (1935) Quoted by Sedallian et al.

Preliminary Communications

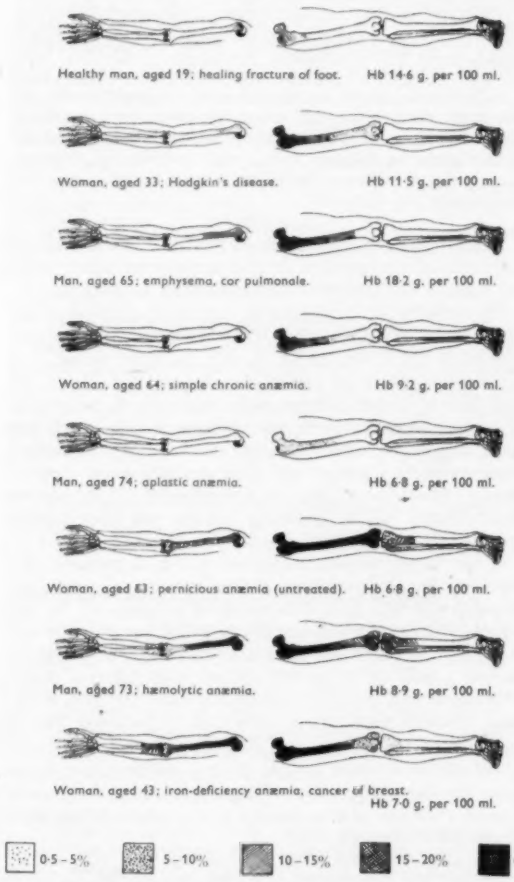
METHOD FOR CLINICAL ASSESSMENT OF MARROW HYPERPLASIA IN LONG BONES

ALTHOUGH microscopic examination of the bone-marrow has become one of the most important methods of investigation in hæmatology, the information it can provide is purely qualitative. Marrow smears reveal the types of cells present and the relative proportions in which they occur; sections of marrow cores, obtained by trephine, yield important information about the pattern of the hæmopoietic tissues and the presence and relative amounts of fat, fibrous tissue, and blood-forming elements at the site examined. But biopsy specimens, unless taken from widely separate areas, can give no indication whatever about the extent of the active marrow, and as bone-marrow is perhaps the most plastic of all tissues, capable of enormous hyperplasia in response to increased demand for blood, this is a serious drawback. It is only at necropsy that the extent of marrow hyperplasia into long bones can be determined, and even then it is rare for more than one or two bones to be examined.

While we were investigating iron metabolism in various blood disorders by the technique described of Wetherley-Mein et al.,[1] it occurred to us to extend the examination to include a study of the iron uptake by the limbs. The procedure we have used is as follows:

Patients were given 6–10 μc of ^{59}Fe as $^{59}FeCl_3$ in 10 ml. 0·1% sodium citrate in sterile saline solution by intravenous injection. External counting with a scintillation probe connected to a scaler was done at the intervals recommended by Wetherley-Mein et al.[1] over the spleen, liver, heart, and sacrum.

In addition, when bone-marrow uptake was at its height (24–30 hours after injection) the limbs were examined in the following way: the arm is measured from acromion to elbow and divided into three equal zones; the forearm between the elbow and wrist joints is similarly measured and divided into three; the thigh between the hip and knee joints is measured and divided into four; and the leg between knee and ankle joints is measured and divided into three. The limits of these zones are marked with a skin-pencil. With the patient lying flat the arm is extended at right-angles to the trunk, and, starting at the lower third of the forearm, the scintillation probe is positioned over the bones in the centre of the marked zone and the number of counts per minute recorded. This procedure is repeated at each successive zone up to the shoulder, and then the same routine is carried out on the leg and thigh. Great care is taken throughout to ensure that at no time is the probe directed towards the trunk whence radiation from the spleen, liver, or bone-marrow might cause spuriously high counts. As an added control, after each successive limb zone is counted, the probe is moved about an inch lateral to the bone and the number of counts per minute is again recorded. The counts obtained in this way, which are taken to represent the background contributed by soft tissue and scattered radiation in the area under examination, are subtracted from the number of counts recorded over the bone, and the net figure thus obtained is regarded as an indication of the approximate amount of radiation emanating from the bone-marrow at that particular site. In the thin distal portions of the forearm and leg the probe might not be directed at any tissue while carrying out these control measurements. Nevertheless, readings are taken to allow correction for local background and scattered radiation in those regions; the contribution by the small amount of soft tissue there is probably negligible.


Healthy man, aged 19; healing fracture of foot. Hb 14·6 g. per 100 ml.
Woman, aged 33; Hodgkin's disease. Hb 11·5 g. per 100 ml.
Man, aged 65; emphysema, cor pulmonale. Hb 18·2 g. per 100 ml.
Woman, aged 64; simple chronic anæmia. Hb 9·2 g. per 100 ml.
Man, aged 74; aplastic anæmia. Hb 6·8 g. per 100 ml.
Woman, aged 83; pernicious anæmia (untreated). Hb 6·8 g. per 100 ml.
Man, aged 73; hæmolytic anæmia. Hb 8·9 g. per 100 ml.
Woman, aged 43; iron-deficiency anæmia, cancer of breast. Hb 7·0 g. per 100 ml.
0·5–5%
5–10%
10–15%
15–20%
Over 20%
Radioactivity in long bones as percentage of radioactivity in liver.

Bone-marrow in limb bones.

The readings obtained with the technique, as it stands, are not regarded as in any sense a quantitative measure of the amount of red marrow present in any part of the long bones. At this stage quantitative interpretation is prevented by imponderable factors—variations in the width of the medullary cavity and its depth below the surface from place to place; the amount of iron taken up by the marrow, which in turn depends on the state of the iron stores of the body, and so on. But it is possible to get some approximate indication of the relative avidity of different parts of the marrow for iron. What is required is some standard of reference against which to measure the radioactivity determined in the various zones of the long bones.

There are several possible standards. The counts obtained in each zone might be expressed as a fraction of the total dose given, but this presents certain practical difficulties. Alternatively the ratios of radioactivity over the sacrum to the activities in different parts or the limb bones might be used as a guide; but this would be of little value in the aplastic anæmias. If, however, one takes the ratio, crude as it is, of liver radioactivity to marrow radioactivity in the different regions of the bones some idea of the relative amounts of the dose of ^{59}Fe being utilised for hæmopoiesis is obtained. Twenty-four hours after the injection of ^{59}Fe very little is left in the blood, almost the entire dose being distributed between the bone-

1. Wetherley-Mein, G., Hutt, M. S. R., Langmead, W. A., Hill, M. J. *Brit. med. J.* 1956, i, 1445.

marrow and liver. We have chosen, therefore, to express the net counts per minute over the various regions of the bones as a percentage of the counts per minute recorded over the liver; and in this way quite clear-cut results are obtained, as is shown in the accompanying figure.

Although the technique gives what appears to be a realistic picture of the extent of active marrow in the long bones we are conscious of its crudeness as it stands. By utilising a special lead collimator for the scintillation probe and an automatic scanner, we hope to improve both the accuracy and the sensitivity of the method. The technique, when refined, should be of considerable value in the study of bone-marrow physiology and pathology in that it should, for the first time, permit dynamic studies on the reactivity of human bone-marrow under various conditions.

We wish to thank the clinical staff of this unit, in particular Dr. A. Freedman, for their cooperation.

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PLASMA PREGNANEDIOL IN HUMAN PREGNANCY

UNTIL recently, attempts to assess the level of endogenous progesterone production have depended either upon the biological assay of circulating progestogen or upon evidence derived from the chemical estimation of pregnanediol or other progesterone metabolites in the urine.

However, after the isolation of progesterone from human placental tissue,[1] the hormone was identified by Zander in human peripheral venous blood collected after the 6th month of pregnancy.[2 3] Its concentration in late pregnancy plasma was found to range from 3·9 to 26·8 μg. per 100 ml. (mean value 14·2 μg.); and, although accurate estimation was not possible in early pregnancy, the level was considered to lie below 5·0 μg. per 100 ml. Similar values for plasma progesterone in late pregnancy plasma were subsequently obtained in our laboratory.[4]

Plasma pregnanediol has been determined after the intravenous administration of progesterone.[5] This earlier work formed the basis for the development of a sensitive method for the quantitative determination of progesterone and pregnanediol in human plasma. A preliminary account of the technique has been given [4 6] and full details have now appeared.[7] Application of the new method revealed the presence of pregnanediol in late pregnancy plasma [6 7] and yielded the results of the present communication.

1. Salhanick, H. A., Noall, M. W., Zarrow, M. X., Samuels, L. T. *Science*, 1952, **115**, 708.
2. Zander, J. *Nature, Lond.* 1954, **174**, 406.
3. Zander, J. *Klin. Wschr.* 1955, **33**, 697.
4. Sommerville, I. F. *J. clin. Endocrin. Metab.* 1957, **17**, 317.

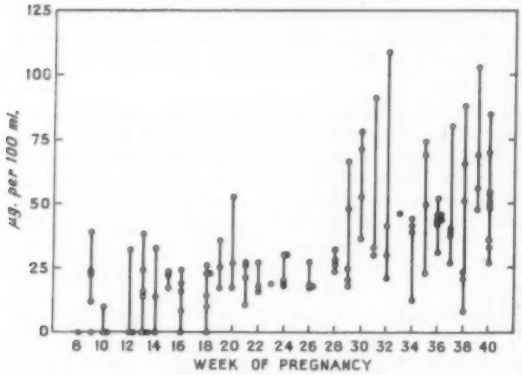

Fig. 1.—Plasma pregnanediol during pregnancy (10 ml. samples of plasma from peripheral venous blood).

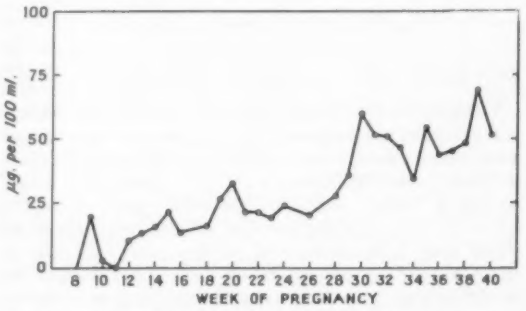

Fig. 2.—Mean values of plasma pregnanediol during pregnancy.

Briefly it consists of the extraction of pre-treated plasma with large volumes of ether/methylene-chloride mixture, followed by chromatography on alumina and micro-colour reactions with isonicotinic acid hydrazide and sulphuric acid. It is supplemented by the use of paper chromatography and is sensitive enough to permit the detection of 1 μg. of either steroid in 10 ml. of plasma. Recoveries of 85–95% were obtained when 0·2–0·9 μg. per ml. of each steroid was added to male plasma. Since the extraction is preceded by enzymic hydrolysis the pregnanediol results represent the sum of the free and conjugated steroid. There are several pregnanediol stereoisomers in human urine, and preliminary evidence suggests that the plasma steroid determined by this method is 5β pregnane-3α, 20α-diol.

RESULTS

The present report is confined to the levels of plasma pregnanediol determined in 150 samples collected from 130 healthy women with uncomplicated pregnancies.

The results are expressed as μg. of pregnanediol per 100 ml. of plasma. The levels observed throughout pregnancy are shown in fig. 1, and the curve in fig. 2 is based upon the mean values obtained weekly. It will be seen that the steroid is measurable from early in pregnancy and that, although the values vary over a wide range, the mean values rise slowly throughout the first and second trimesters with a steeper rise after the 28th week. Immediately after delivery, there is a very rapid fall in plasma pregnanediol, which generally reaches an undetectable level within twenty-four hours.

Consecutive samples were analysed in 2 patients (not shown in fig. 1) in whom higher values were obtained between the 30th and 40th weeks of pregnancy. In one subject, the level rose rapidly from 40 μg. per 100 ml. at the 30th week, to 120 μg. at the 38th week. In the other subject a level of 80 μg. per 100 ml. was observed at the 30th week, and this was maintained until the 37th week, when spontaneous labour occurred. The level during labour rose to 160 μg. per 100 ml. and then fell to an undetectable amount twelve hours postpartum. Apart from the premature onset of labour in this subject, there was no evidence of abnormality in the course or outcome of the two pregnancies.

5. Sommerville, I. F. *Proc. R. Soc. Med.* 1952, **45**, 807.
6. Sommerville, I. F., Deshpande, G. N. *Bull. Acad. nat. Méd., Paris*, 1958, **9**, 229.
7. Sommerville, I. F., Deshpande, G. N. *J. clin. Endocrin. Metab.* 1958, **18**, 1223.

DISCUSSION

In view of the variation in plasma concentration, the mean values reported in a group of this size must be considerably influenced by the choice of subject. In order to obtain detailed information about the pattern of plasma concentration throughout pregnancy, a large number of consecutive assays will have to be made in individual subjects. Furthermore, it should be possible to study such acute changes in plasma concentrations as may occur before and during parturition and to investigate the renal clearance of the steroid.

Comparison of these results with those obtained for plasma progesterone is limited by the fact that the progesterone levels have not been studied in detail throughout pregnancy. However, comparison of the amounts observed in late pregnancy indicates that the concentration of plasma pregnanediol is approximately five times that of plasma progesterone. In fact, the pregnanediol concentration of peripheral venous blood is similar to that reported for the progesterone content of placental venous blood.[8 4] It will be important to determine the progesterone/pregnanediol ratios under physiological and pathological conditions, and such information may indicate whether a lack of effective progesterone concentration at the target organ is due to a low level of endogenous secretion or to a disorder of intermediary metabolism.

We wish to record our indebtedness to the late Sir Charles Read; to the consultant staff and sisters in charge of the antenatal department of Queen Charlotte's Maternity Hospital; and to the British Empire Cancer Campaign for a grant from which part of the expenses was defrayed. The work was done during the tenure of fellowships from the Harmsworth Trust and the Royal College of Physicians of Edinburgh.

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My thanks are due to Dr. T. M. Wilson, medical superintendent, and to Miss E. Sculthorpe, matron, for their kind permission to publish this note.

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8. Zander, J., von Münstermann, A.-M. *Klin. Wschr.* 1954, **32**, 894.

Reviews of Books

Gray's Anatomy

32nd ed. Editors: T. B. JOHNSTON, M.D., professor emeritus of anatomy, University of London; D. V. DAVIES, M.A., M.B., professor of anatomy, St. Thomas's Hospital Medical School, University of London; F. DAVIES, M.D., D.SC., F.R.C.S., professor of anatomy, University of Sheffield. London: Longmans, Green. 1958. Pp. 1604. £6 6s.

Gray has reached its 32nd edition and its centenary year. Other works on anatomy have been held to be better and still may be; but none have won such popularity. Excellent texts on human anatomy have languished, and now linger on library bookshelves in outdated editions. Some may have been ousted by their lusty rival, but this is not an adequate explanation, for it ignores the differing needs of students of human anatomy. The same approach and content cannot suit medical and dental students, physiotherapists, postgraduates (general surgeons, dental surgeons, ophthalmologists, and many other specialists), *and* professional anatomists. Most of these groups require a special text, and obviously that entails subdivision of the "anatomical public", but neither publishers nor authors care to launch a work for so small an audience that it is unlikely to pay its way, however excellent. Hence many who need a book on human anatomy are still without a volume based on their needs: they must look for a compromise.

This may account in part for the success of the sumptuous volume which has so far outgrown in size and price Henry Gray's relatively small book: it is a great compromise. Most students acquire it, and are duly impressed by its magnificent air of erudition. But to *read* such a book, even once, is a task few undertake. Yet a textbook ought to be something of a "guide, philosopher, and friend", and Gray's austere pages scarcely provide this. Students may remain uncertain, as indeed many of their teachers are, whether Gray is a text or a work of reference. The subtitle, Descriptive and Applied, gives a hint, and the text is mostly an able account of the arcana of human topography, with occasional reference to their application. But reference alone cannot be the intention; many sections are prefaced by introductory remarks which provide, indeed, the best reading. Some of these are well in line with recent work, not only in anatomy but in cognate studies. They blow into the stale atmosphere of structural detail an invigorating breath which may yet veer this august argosy of anatomy towards a livelier interpretation of the body.

Gray is the product of an era of unhampered dissection and an ever-widening gulf between the pursuit of topographical detail and all that enlivens this lore with comprehension. Departure of so much into the hands of other specialists, though inevitable to progress, has left a hard core of gross topography, preserving at its worst no more than a customary link with surgery. But anatomists have never completely abandoned the proper ingredients of their subject; there have always been some disinclined to detached description. Unfortunately anatomical description *can* be separated from all that makes structure significant. Such teaching does harm, creating a narrow view of human anatomy, even among the most able clinicians, whose condemnation is wrongly based on unfortunate student experience. They will, nevertheless, find some agreement amongst anatomists of recent decades, for many would relinquish much detail for more understanding.

The chief criticism of Gray is that it is unsuitable for beginners, who still form the largest element in its public. The amount of information is too great, the style of description too dry a wine for young palates. It does not stimulate the tyro to explore a new continent; it shows an old one where almost all apparently has been discovered. The wisdom in the general remarks is often neglected, being too far removed from the descriptive text. For those who return to anatomy this is less serious, though many are already settled in the groove of mere topographical study. They have, however, the advantage of clinical experience which enlivens the monstrous task of memorisation still expected of them in their examinations.

Those who use Gray for reference are many and grateful. The ultimate in detail cannot be expected, though each edition, like the latest one, is brought into line with much of recent progress. Many anatomists, and others, must have felt the need of something more compendious, more generous in its documentation, than Gray pretends to be. This would require a larger editorial board and doubtless some kind of subsidy, as is arranged for certain authoritative Continental works to which anatomists are often obliged to turn.

What is needed, perhaps, are several new books, separate works aimed at readers with different needs. Some recent progress has been made along these lines, but until all are aptly served the Great Compromise must proceed on its second century of service. To all, from Henry Gray to the present day, who have steered it through a hundred years, we offer respectful admiration and congratulations.

Practical Allergy

M. COLEMAN HARRIS, M.D., F.A.C.P.; NORMAN SHURE, M.D., F.A.C.P. London: Butterworth. 1957. Pp. 471. 52*s*. 6*d*.

THIS book attempts to give the clinician who is not a specialist in allergic diseases an outline of the practical approach to these conditions. The authors have confined themselves to the generally accepted and established principles, and the more controversial points are only briefly mentioned.

Simplified definitions are given of the immunological terms used to describe allergic reactions, and are followed by a discussion of the special ways of taking an "allergic" history. The methods of testing the skin and other tissues for allergic sensitivity are described, and reference is made to the variables which influence the appearance and interpretation of the test reactions. The allergens responsible for clinical manifestations are discussed in terms of pollen, non-pollen, food, drug, and other causes.

Rigorous pruning of the text has led to the omission of important information. For example, there is no discussion of the very different and more hopeful prognosis of "extrinsic" asthma starting early in life, with a long history of allergic disorders and with the common finding of allergic causes, compared with "intrinsic" asthma, starting later in life, associated not infrequently with aspirin hypersensitivity, but not with the more usual allergic causes. Such differences can influence the decision to use corticosteroids or at least indicate the need for caution.

The authors' views on psychological factors may not be generally accepted. They believe that, important though these factors may be in aggravating allergic manifestations, just as they aggravate other disorders, they are not to be regarded as an important primary cause. Such views are not unexpected from clinicians who seek to identify responsible allergens and who see them as more important than sometimes tenuous speculations.

So Great a Mystery

KENNETH WALKER. London: Gollancz. 1958. Pp. 224. 18*s*.

IN this interesting book the author tries to see things "whole", and in his quest for higher enlightenment he studies the great world religions, drawing attention to common features, especially in their attitudes to mental discipline and mystical experience. Despite the haziness of this borderland of religion, philosophy, and psychology, the matter is clear and easy to read. And it is well worth reading, for it is all too easy for doctors to become preoccupied with disease and to equate higher realms of consciousness with "trance-like states", thinking of schizophrenia. The experiences resulting from a long mystical training are not among the daily items of clinical observation, but, as Mr. Walker shows, an impressive testimony exists to their reality. The psychoanalysts have long held the field with their downward-orientation into the murky unconscious and their negation of spiritual matters: it is time to look upwards. Abnormal does not necessarily mean subnormal, and the supernormal deserves more attention than it is at present getting.

Mr. Walker joins Toynbee in anticipating a great religious revival starting outside the Church and reconciling "original" Christianity with the best in the other great faiths. It is a pity that the views of Rudolf Steiner are not discussed because, starting from a very similar foundation, he has carried such a unified view of life very much further. If the mystical state is as remarkable as it seems, and if this communion with the universe does lead to the higher understanding which so many have claimed, it is surprising that the initiates have not turned their special knowledge to concrete testable use, and surprising too that the subject is so little thought and written about. These obvious criticisms are not really met in the book.

The Origins of Medical Terms

The Story Behind the Word. HARRY WAIN, M.D., health commissioner, Ohio. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1958. Pp. 342. 63*s*.

THIS useful reference book and "treasure house of linguistic adventure" consists of an alphabetical compilation of nearly 6000 derivations of medical terms, giving the origin and history of each term, together with brief biographies of great personalities of medicine. A random sample shows that it is informative and accurate, although it failed to supply information about poikilocytosis. It is not easy to determine how the personalities were selected. Lesser lights are included, yet, in an American book, William Beaumont is omitted. Lister is well done in a hundred words. Here are two samples:

Enema. Literally meaning a medicine "thrown in" to the bowel this word is derived from the Greek word "eniemi" meaning to cast or throw in. The use of "enemas or clysters" is one of the most ancient of all medical procedures and goes back into antiquity. There is an old Egyptian legend which according to Pliny ascribes the invention of the enema to the sacred bird known as the ibis. This bird supposedly injected water into its bowel by means of its beak.

Tuke, William (1732–1822). A wealthy Quaker merchant, who while not a physician or social worker, founded a hospital for the insane. The Retreat at York, which he founded became a model for many mental institutions. He insisted upon the abandonment of chains, manacles and mechanical restraints for the insane.

The Principles and Practice of Medicine (4th ed. Edinburgh: E. & S. Livingstone. 1958. Pp. 1067. 35*s*.).—Many medical texts are prefaced by the hope that they will be of value to graduates and undergraduates; but in fact they are read chiefly by those about to qualify and aspirants for higher degrees—that is to say, those about to take examinations. Once over these hurdles most doctors pass into specialties, and if they want to know something outside their subject they ask a colleague who has specialised in it; or if they want to know something in their own field they refer to the literature or to special textbooks. Few family doctors today attempt any form of specialist practice without consultant's advice—advice that is widely and freely available. Thus, with the change in the practice of medicine, the scope of general textbooks has changed too. Editors of general textbooks must now aim at writing works of instruction, which can be read, and not works of reference. They should emphasise general rather than special principles of disease. And above all that their works should be based on solid foundations of physiology and anatomy. These are broadly the aims of the successful Edinburgh text, edited by Sir Stanley Davidson, and the continuing demand for it shows that he and his contributors have done their work well.

The perfect general textbook has yet to be written, may indeed be impossible to write, but this one deserves high praise. It is short, clear, and authoritative, and some chapters come near to perfection. No-one could read the account of diabetes mellitus without profit, and the sections on diseases of the heart and blood are excellent. Some chapters are not quite so good, and the one on renal disease might benefit from a further revision. The book can be recommended to students on many grounds—not least that they will be able to afford it and to read it.

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See Lancet, July 22, 1899, p. 219

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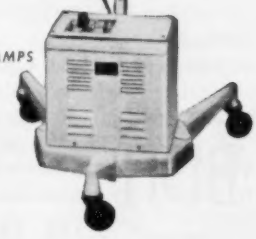

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Auto-immunity in Thyroid Disease

IN 1956 ROITT, DONIACH, CAMPBELL, and HUDSON [1] showed that serum from patients with Hashimoto's disease contained an antibody which reacted with human thyroid extracts. In the same year ROSE and WITEBSKY [2] produced somewhat similar thyroid lesions in rabbits immunised against rabbit thyroid extract. When we reviewed the subject some eighteen months ago [3] it seemed reasonable to put these two pieces of evidence together in the hypothesis that Hashimoto's disease was caused by the action on the thyroid of antibodies produced by the patient's own tissues. It was easy to see that a reaction of this type, once initiated, might become self-perpetuating; for damage to the thyroid, caused by antibody action, would itself release more antigen and hence enhance the level of circulating antibody. The cause of the initial release of antigen, which was presumably responsible for setting this chain-reaction in motion, remained obscure; but it was not difficult to postulate that it might be some relatively trivial damage to the thyroid which perhaps was difficult or impossible to detect.

The initial observations excited considerable interest and have led to much further work, particularly in this country. There have been two main developments: first, it now seems that auto-antibody reactions can occur in other types of thyroid disorder besides Hashimoto's disease; and secondly the antigens involved may apparently be multiple.

Clinical investigation [4–6] had previously shown that antibodies can be found in the serum of cases of "primary" or "spontaneous" myxœdema—that is, in acquired hypothyroidism without goitre. In our present issue these conclusions have been substantiated on a larger scale by Dr. ROITT and Dr. DONIACH, and by Dr. OWEN and Professor SMART, who found positive serological reactions in 83% and 81% of cases of non-goitrous hypothyroidism. These findings support the inference from purely histological studies [7 8] that primary myxœdema and Hashimoto's thyroiditis share the same pathological process. It seems reasonable to suppose provisionally that both conditions are partly or wholly caused by an auto-immune process. In Hashimoto's disease the normal reaction to incipient hypothyroidism (production of thyroid-stimulating hormone by the pituitary) has brought about hypertrophy of the remaining healthy thyroid tissue, and thus has both created a goitre and compensated (partly or wholly) for the destruction of active thyroid tissue. In primary myxœdema, on the other hand, insufficient healthy tissue has remained to permit an adequate response to the pituitary hormone. This hypothesis is of course purely provisional, but seems at present to be the most acceptable view of the situation revealed by recent work.

Antibodies against thyroid extracts have also been found, however, in other thyroid disorders. In particular it is evident that they are present quite often (though usually only to a low titre) in the serum of patients with thyrotoxicosis. By using a combination of tanned-red-cell and complement-fixing techniques, ROITT and DONIACH were able to detect antibodies in no less than 64% of their cases of thyrotoxicosis; in simple goitre and thyroid cancer antibodies were found in 31% and 29%. This contrasted with uniformly negative results with complement fixation in 195 control sera; about 5% of the control sera gave positive results with the tanned-red-cell method. It should be remembered that it is virtually impossible to select controls whose thyroids can be guaranteed to be normal, since routine post-mortem examinations have revealed an appreciable proportion of Hashimoto-like changes in the thyroids of middle-aged or elderly women who had not been thought clinically to have thyroid disease.[9] It still seems probable that positive serological reactions are correlated with lymphocytic infiltration of the thyroid and other changes characteristic of Hashimoto's disease; but up to now this has not been proved—largely, perhaps, owing to the difficulty of obtaining enough histological material. Possibly we should think in terms of a reaction, expressed histologically by lymphocytic and plasma-cell infiltration, and serologically by antibodies against human thyroid extract, rather than in terms of "diseases" defined by the pathologist and the clinician. On this view it would be possible to picture the same auto-immune reaction occurring in a localised form in a wide variety of thyroid disorders (including some not detected by the clinician). Only when the same process has involved much of the gland would its effects become clinically evident.

On the immunological side it was early shown that a precipitin reaction could often be obtained between the serum of patients with thyroid disease and a purified preparation of human thyroglobulin. The more sensitive procedure used by ROITT and DONIACH involves coating the surface of tanned red blood-cells with thyroglobulin. Although current preparations of thyroglobulin are certainly not 100% pure it seems reasonable to suppose that in this type of reaction thyroglobulin itself is the relevant antigen. But early experience with complement-fixation techniques led TROTTER et al.[4] to suggest that a quite different antigen might be involved in this reaction. This suggestion

1. Roitt, I. M., Doniach, D., Campbell, P. N., Hudson, R. V. *Lancet*, 1956, ii, 820.
2. Rose, N. R., Witebsky, E. *J. Immunol.* 1956, **76**, 417.
3. *Lancet*, 1957, i, 1075.
4. Trotter, W. R., Belyavin, G., Waddams, A. *Proc. R. Soc. Med.* 1957, **50**, 961.
5. Doniach, D., Roitt, I. M. *J. clin. Endocrin.* 1957, **17**, 1293.
6. Goudie, R. B., Anderson, J. R., Gray, K. G., Clark, D. H., Murray, I. P. C., McNichol, G. P. *Lancet*, 1957, ii, 976.
7. Bastenie, P. *Bull. Acad. roy. Méd. Belge*, 1944, **9**, 179.
8. Douglas, R. C., Jacobson, S. D. *J. clin. Endocrin.* 1957, **17**, 1354.
9. Hazard, J. B. *Amer. J. clin. Path.* 1955, **25**, 399.

has now been confirmed and amplified by ROITT and DONIACH. Reactions with the unknown antigen can at present be detected only by complement fixation. Sera containing both types of antibody can be completely absorbed with thyroglobulin, leaving the complement-fixation reaction with the other antigen unaffected. The richest source of the new antigen has been found to be thyroids from patients with thyrotoxicosis, though it has also been detected in normal thyroids. Differential centrifugation in sucrose shows that it is deposited in the microsomal fraction, and thus strongly suggests that it is an intracellular component. The inference would seem to be that antibodies can be formed both against thyroglobulin, contained in the acini, and against an unknown substance, contained in the thyroid cells. If antibodies do in fact damage the thyroid it would be reasonable to suspect that the one directed against the intracellular component was mainly responsible.

The second antigen has still to be identified. Although the serological reactions of this substance seem to differ widely from those of thyroglobulin we may not infer that the chemical constitutions of the two substances are necessarily very different. Serological reactions with antisera obtained from the same species have a much greater differentiating ability than those obtained by injecting material into other species. Hence if both antigens were obtained in the pure state, and injected into rabbits, the resulting antisera would not necessarily be distinguishable by serological tests. The possibility therefore remains open that the new antigen is a product of thyroglobulin synthesis or degradation, although there is no direct evidence for this view.

Not all the recent findings fit in with the original simple view of the ætiology of Hashimoto's disease, in which it was supposed that leakage of antigen due to minor thyroid damage caused the formation of antibodies, which in turn inflicted further damage and so set up a chain reaction. ROITT and DONIACH's experience with subacute thyroiditis has clearly shown that this chain-reaction is far from inevitable. In cases thought to be due to viral infection of the thyroid, autoantibodies do indeed appear in the blood temporarily, but their subsequent disappearance shows that they have not caused any self-perpetuating damage to the gland. Similarly, ROITT and DONIACH have now had experience of many types of thyroid disorder in which antibodies of either or both varieties are found, but in which there is no inevitable progression in the direction of gland damage. They are somewhat disturbed by their inability to cause any histological changes in the thyroid of a monkey by passive transfer of serum from two cases of Hashimoto's disease. Certainly this experiment would have been highly significant if it had yielded positive results, but it is difficult to see that mere inability to inflict damage on the monkey's thyroid has any direct bearing on the ability of similar antisera to cause human disease. In their experiments the Coons technique demonstrated that none of the administered antibody had in fact entered the thyroid, so it seems unreasonable to expect it to have caused any damage. The failure of Hashimoto serum to influence human thyroid in tissue culture is likewise no sure guide to reactions within the human body.

If the hypothesis of damage by direct antibody action were to be rejected, apparently only two other possibilities would remain. One is that the occurrence of antibodies in thyroid disease is a by-product of damage to the gland from some other cause—an interpretation that would imply that the experimental production of comparable lesions in rabbits immunised against their own thyroids is one of Nature's intricate immunological jokes. The other possibility, suggested by ROITT and DONIACH, is that the antibodies act indirectly by a " delayed " hypersensitivity reaction. This type of reaction may indeed have been operating in ROSE and WITEBSKY's [2] rabbit experiments, since Freund adjuvants (containing killed tubercle bacilli) had to be used in conjunction with thyroid extract in order to obtain any notable thyroid damage. The observations of BUCHANAN et al.[10] would be compatible with a mechanism of this type. They showed that intradermal injection of a thyroid extract provoked local skin reactions (similar to those seen after tuberculin injection in sensitised subjects) in patients with thyroid disease but not in controls. The intensity of the skin reaction seemed to be correlated with the amount of precipitating antibody demonstrable in the serum. These experiments would have been more significant if they had been made with preparations of the two antigens separately rather than an extract of thyrotoxic thyroid, which almost certainly contains both. Nevertheless they do seem to show that the tissues of patients with high levels of circulating antibody may become sensitised to some factor or factors in thyroid extracts. Some such process might conceivably account for the other lesions (nephrosis, cirrhosis, Paget's disease) observed by LUXTON [11] in patients with Hashimoto's disease. It is not very easy to picture the situation in the thyroid under these conditions, but presumably the antibody might become fixed to thyroid cells and sensitise them to an antigen either inside them or within the colloid. In considering the hypersensitivity hypothesis it is worth remembering that the process need not necessarily be brought about by one of the antibodies which we have learnt to recognise. There may be others of the type which immunologists rather disparagingly call " incomplete ", because they do not reveal their presence in the usual laboratory tests. Such undetected antibodies may cause the damage to the thyroid, either directly or by means of a hypersensitivity reaction and the ones we can measure may merely indicate that an immune response has occurred.

There are obviously still many unsolved problems relating to auto-immunity in thyroid disease. If they can be solved it is likely that the new knowledge will be applicable to diseases of other organs.

10. Buchanan, W. W., Anderson, J. R., Goudie, R. B., Gray, K. *Lancet*, Nov. 1, 1958, p. 928.
11. Luxton, R. W. *Proc. R. Soc. Med.* 1957, **50**, 943.

The Stomach in Pernicious Anæmia

THERE has developed an argument about the relation of stomach lesions to iron-deficiency anæmia: does iron deficiency itself cause the stomach lesion, or does the stomach lesion prevent proper absorption of iron? There is, in fact, evidence both ways: DAVIDSON and MARKSON [1] and BADENOCH et al.[2] found that most patients with iron-deficiency anæmia had gastric abnormalities, and argued that the iron deficiency was responsible; on the other hand, LEES and ROSENTHAL [3] found that, even a year after iron treatment had restored the blood-count to normal, gastric lesions that were originally present were unaltered or worse, and they therefore took the "stomach first" view. This argument has now spread to involve the ætiology of pernicious anæmia. The classical view has been that the gastric lesion comes first, eventually leading to complete failure of secretion of acid and enzymes including intrinsic factor; and consequently pernicious anæmia develops in due course, since without intrinsic factor vitamin B_{12} is not properly absorbed from the food. But since the adoption of gastric biopsy by the technique of WOOD, DOIG, and their coworkers,[4] it has been found that the gastric lesion in patients with pernicious anæmia varies; and it is no longer certain that there is a specific stomach lesion preceding or accompanying the appearance of pernicious anæmia. MAGNUS [5] has reviewed this controversy in a Kettle lecture.

It is now well established that it is the secreting glands of the body of the stomach, the upper two-thirds, that are responsible for enzyme and intrinsic-factor production; the pyloric area is not concerned. In 1938 MAGNUS and UNGLEY [6] showed that in the stomachs of pernicious-anæmia patients, fixed as soon as possible after death, abnormalities were confined to the mucosa of the body of the stomach, and MAGNUS confirmed this observation in 1952.[7] The changes seen were striking: the upper two-thirds of the stomach was "reduced to the thickness of parchment", whereas the lower third was of normal thickness. Microscopy showed that all the coats of the stomach in the body area were atrophic; the mucosa was reduced to surface epithelium and a few glands lined only by mucus-producing cells; the muscle coat was also atrophic; nowhere was there any fibrosis, cellular infiltration, arteritis, or other evidence of past inflammation. This atrophic lesion did not seem to be inflammatory; it was possibly due to endocrine or nutritional deficiency or might even be congenital: at the time most workers thought it was specific for pernicious anæmia. But biopsies of stomach mucosa by WOOD and his colleagues [8] yielded quite a different picture. Of 100 patients with pernicious anæmia or subacute combined degeneration of the cord, only 40 showed the classical atrophic lesion; the remaining 60 showed atrophy combined with an inflammatory lesion characterised by widespread cellular infiltration of the mucosa, and in these cases foci of specific enzyme-secreting cells remained intact. WITTS [9] has suggested that these two groups represent separate conditions of different ætiology; but MAGNUS, after examining much material, agrees with DAVIDSON and MARKSON [1] that these are all stages in the same pathological process, and that the postmortem appearances represent the final stage of a condition that has been present for many years.

It is also well established that histamine-fast achlorhydria is compatible with apparently perfect health, and the gastric-biopsy work has established that severe gastric atrophy is not necessarily associated with the clinical picture of pernicious anæmia. Pernicious anæmia may ensue; for example, ROBERTSON et al.[10] recorded the case of a man with gastric atrophy and originally normal bone-marrow who developed typical pernicious anæmia with neurological complications five years later. MOLLIN et al.[11] found 5 patients with histamine-fast achlorhydria and typical gastric lesions who did not have clinical pernicious anæmia, but when tested with labelled vitamin B_{12} they absorbed no more than a pernicious-anæmia patient. MCINTYRE et al.[12] found that in the families of pernicious-anæmia patients individuals could be found showing subnormal absorption of labelled vitamin B_{12}. We also know from the effects of total gastrectomy that it takes at least two years before clinical signs of megaloblastic anæmia appear, because the general body stores of vitamin B_{12} last that long. The gastric lesion has been shown by many workers to be quite irreversible; and after regular treatment for years has removed all clinical evidence of pernicious anæmia even with initial neurological complications, it is still unaltered.

From all this evidence MAGNUS concludes that the original idea that the gastric lesion in pernicious anæmia is a specific one and not the end-result of an atrophic gastritis has to be modified. He thinks that the basic lesion in pernicious anæmia does not lie in the stomach: "The changes in the gastric mucosa may well be endogenous in origin and due to the fact that the intrinsic factor or its precursors are necessary for the maintenance of its normal structure and function. The basic lesion would appear to be an inherited chemical defect, perhaps expressed by the inability of certain cells of the gastric mucosa to manufacture an essential enzyme." This conception will be supported by those clinicians who maintain that pernicious anæmia is a specific clinical entity characterised by a well-recognised combination of signs and symptoms, the presence of histamine-fast achlorhydria, typical changes in the erythroblasts and granulocytes of the bone-marrow, and a proper therapeutic response to parenteral vitamin B_{12}, suitable oral

1. Davidson, W. M. B., Markson, J. L. *Lancet*, 1955, ii, 639.
2. Badenoch, J., Evans, J. R., Richards, W. C. D. *Brit. J. Hæmat.* 1957, **3**, 175.
3. Lees, F., Rosenthal, F. D. *Quart. J. Med.* 1958, **27**, 19.
4. Wood, I. J., Doig, R. K., Motteram, R., Hughes, A. *Lancet*, 1949, i, 18.
5. Magnus, H. A. *J. clin. Path.* 1958, **11**, 289.
6. Magnus, H. A., Ungley, C. C. *Lancet*, 1938, i, 420.
7. Magnus, H. A. *in* Modern Trends in Gastroenterology. London, 1952.
8. Joske, R. A., Finckh, E. S., Wood, I. J. *Quart. J. Med.* 1955, **24**, 269.
9. Witts, L. J. Anæmia and the Alimentary Tract. Edinburgh, 1956.
10. Robertson, E. G., Wood, I. J., Joske, R. A. *Lancet*, 1955, ii, 69.
11. Mollin, D. L., Booth, C. C., Baker, S. J. *Brit. J. Hæmat.* 1957, **3**, 412.
12. McIntyre, P. A., Sachs, M. V., Krevans, J. R., Conley, C. C. *Arch. intern. Med.* 1956, **98**, 541.

preparations of liver or whole stomach, or vitamin B_{12} combined with human gastric juice. If any of these criteria are absent—for example if free hydrochloric acid is present in the gastric juice—the name pernicious anæmia should not be used. We do not now use the name " pernicious anæmia of pregnancy "; it is properly called " megaloblastic anæmia of pregnancy ". We know that there exists a megaloblastic anæmia which responds to parenteral vitamin B_{12} that is not pernicious anæmia; it may be nutritional in origin,[13] or defective absorption *not* connected with absent intrinsic factor may be responsible [9]; in some cases no clear cause has yet been established.

A lively argument is also in progress about the role of the intrinsic factor secreted by the chief cells of the glands of the body of the stomach. The original conception of CASTLE and of WILKINSON was that the gastric intrinsic factor combined with extrinsic factor in the food to form an antianæmic principle that was stored in the liver. This has been reinterpreted in the form that the gastric intrinsic factor by acting on vitamin B_{12}, which is extrinsic factor, enables it to be absorbed in the intestine, and that a store of such absorbable vitamin B_{12} exists especially in the liver. Original experiments showed clearly that when as little as 5 μg. of vitamin B_{12} was incubated with normal human gastric juice and the mixture was given to a pernicious-anæmia patient, a reticulocyte response ensued. But MEYER et al.[14] showed that without intrinsic factor oral doses of vitamin B_{12} varying from 75 μg. to 300 μg. daily produced clinical and hæmatological remission in 5 out of 7 patients with pernicious anæmia, though there was little increase in reticulocytes. CHALMERS and HALL [15] found that as little as 50 μg. of vitamin B_{12} taken daily by mouth apart from food could cause some hæmatological response, but they agreed that an oral dose of 2000 μg. was needed to produce the same effect as a parenteral dose of 20 μg. REISNER et al.[16] showed that regular maintenance with oral vitamin B_{12} without intrinsic factor was possible if 1000 μg. was given at intervals of one or two weeks; 43 patients were maintained satisfactorily for an average of twenty-one months. But everyone with experience of the oral treatment of pernicious anæmia with vitamin B_{12} without intrinsic factor knows that it is an uncertain business and that some cases are completely resistant. DOSCHERHOLMEN and HAGEN,[17] studying the uptake of labelled vitamin B_{12}, found evidence that there are two mechanisms of intestinal absorption: one, mediated by intrinsic factor, is characterised by a more gradual and prolonged plasma absorption curve; in the second, found when much larger doses of vitamin B_{12} are given without intrinsic factor, there is an early and rapid rise of plasma-vitamin B_{12}. They found that there was much individual variation in the absorption gradient when doses of vitamin B_{12} above the physiological range were given to pernicious-anæmia patients; BAKER and MOLLIN [18] found similar individual variations for the absorption of physiological doses of vitamin B_{12} with added intrinsic factor.

Since intrinsic factor is necessary for absorption of physiological doses of vitamin B_{12}, preparations combining a source of intrinsic factor with suitable amounts of vitamin B_{12} have been tried for the oral treatment of pernicious anæmia. The results have been strangely disappointing.[19] The initial response is often excellent; but, after the patient has been maintained for a time on such preparations, the red-cell and hæmoglobin levels begin to fall and even increased doses do not produce a satisfactory response. Nevertheless the patients respond well enough to parenteral vitamin B_{12}. A possible explanation is that the animal intrinsic-factor preparations used stimulate a foreign-protein type of resistance,[20] but this does not explain why patients can be successfully maintained for years on preparations of desiccated whole hogs' stomach. HEATHCOTE and MOONEY [21] believe that vitamin B_{12} exists naturally combined in protein compounds and that intrinsic factor acts by breaking down the vitamin-B_{12} protein compounds to a vitamin-B_{12} peptide complex which can be absorbed in the intestine. Their work has been sharply criticised by correspondents, particularly because it lacked suitable controls and because it has yet to be shown that resistance does not develop with long-term use. Efforts at isolating intrinsic factor have not yet been successful, but LATNER [22] points out that three apparently homogenous highly purified preparations of intrinsic factor with molecular weights of 5000, 15,000 and 40,000 are now known; GLASS et al.[23] have suggested that intrinsic factor is really a reactive or prosthetic group contained in various materials with intrinsic-factor activity.

All this study of the role of the stomach in pernicious anæmia has tended to relegate the role of the liver to that of a mere storehouse. But the original workers assigned a more active part to the liver, and a recent communication by NYBERG and REIZENSTEIN [24] suggests that the liver should not be so ignored. These workers injected labelled vitamin B_{12} into pigs; the pigs were killed and the liver was given orally to healthy persons and to pernicious-anæmia patients. The absorption of vitamin B_{12} in liver was strikingly higher than that of a similar dose of crystalline vitamin; in 4 pernicious-anæmia patients the average percentage absorption figures were 61·2 for liver vitamin B_{12} and 6·2 for the crystalline vitamin.

It is really surprising how many questions about pernicious anæmia remain unanswered; how fortunate it is that effective treatment has not had to wait for their solution.

13. Harrison, R. J., Booth, C. C., Mollin, D. L. *Lancet*, 1956, i, 727.
14. Meyer, L. M., Sawitsky, A., Cohen, B. S., Krim, M., Fadem, R. *Amer. J. med. Sci.* 1950, **220**, 604.
15. Chalmers, J. N. M., Hall, Z. M. *Brit. med. J.* 1954, i, 1179.
16. Reisner, E. H., Jr., Weiner, L., Schittone, M. T., Heuck, E. A. *New Engl. J. Med.* 1955, **253**, 502.
17. Doscherholmen, A., Hagen, P. S. *J. clin. Invest.* 1957, **36**, 1551.
18. Baker, S. J., Mollin, D. L. *Brit. J. Hæmat.* 1955, **1**, 46.
19. *Lancet*, 1957, i, 775.
20. Schwartz, M. *ibid.* July 12, 1958, p. 61.
21. Heathcote, J. G., Mooney, F. S. *ibid.* 1958, i, 982.
22. Latner, A. L. *Brit. med. J.* Aug. 2, 1958, p. 278.
23. Glass, G. B. J., Stephenson, L., Rich, M., Laughton, R. W. *Brit. J. Hæmat.* 1957, **3**, 401.
24. Nyberg, W., Reizenstein, P. *Lancet*, Oct. 18, 1958, p. 832.

Annotations

CARDIOLOGY AS A SPECIALTY

THE committee on cardiology of the Royal College of Physicians [1] has reiterated its opinion, expressed in 1947,[2] that a greater number of "specialized consultant cardiologists" should be appointed to our hospitals. It says that there should be a fully equipped department of cardiology at a main teaching hospital in every medical school; that a cardiologist should be appointed to every major hospital centre, where he would have a department including beds and outpatient sessions; and that one or more cardiologists should be appointed in every area where access to a major hospital is not easy. The "cardiologist" is defined as "a physician trained in cardiology", and recommendations are made for a period of at least five years' training after registration.

All will agree with the committee that "cardiology remains an important part of medicine, and cannot, without danger to its own vitality, allow itself to become cut off from the larger whole". But, as in 1947, we fear that some of its proposals may have just this separating effect. The proposed minimum requirements call for no work outside cardiology at any time after completion of a two-year registrarship in general medicine. Admittedly the training period cannot be indefinitely extended to provide deeper understanding of other subjects; but such understanding could be developed after training is completed. One way of encouraging this would be to appoint —in some of the smaller hospital centres, at least— doctors who would work as general physicians as well as cardiologists. Even for research such appointments might prove fruitful; for progress in this subject, more perhaps than in most others, depends on knowledge of general medicine and acquaintance with other disciplines. Clinically, too, there is much to be said for the physician-cardiologist. It is one thing to have a regional cardiological centre where surgery is practised, intractable clinical problems are resolved, and research is encouraged. It is another to have pure cardiologists, in every major hospital centre and in every area where access to hospitals is difficult. This scheme consorts oddly with the committee's view that "recognition of specialized consultant cardiologists should in no way reduce the work or diminish the interest of general physicians in the many facets of cardiovascular disease." If specialists in cardiovascular diseases are to be readily available, they will erode the general physician's already shrunken territory.

Has the hospital service of the future any place at all in fact for the general physician? This is the underlying question which needs to be deliberately faced. If present trends continue, it will answer itself.

TUBERCULOSIS AMONG THE GURKHAS

OF the many ways of judging a medical service, none perhaps is more valid than to measure it by the trust it inspires in those whom it serves. By this test the scheme which aims at eliminating tuberculosis among the Gurkhas in the British Army, and which has now been in operation for some years, ranks high.

As part of a campaign to eradicate tuberculosis from the Brigade of Gurkhas and their families, a Gurkha sanatorium was established at Kinrara, a few miles outside Kuala Lumpur, in 1951 (the Gurkhas serve in Malaya, Singapore, and Hong Kong). The sanatorium began with 18 beds; but within a few years the number of patients, including the families of soldiers, rose to 100 or more. These years of expansion coincided with the rapid increase in the scope and safety of surgery for pulmonary tuberculosis: and soon the Army authorities realised they must offer their patients the benefits of thoracic surgery as well as those of the sanatorium. This involved the transfer of selected groups to this country, a task which needed more than skilled organisation, careful budgeting, and clinical judgment. Mackay-Dick [1] recently drew a vivid picture of some of the many difficulties encountered in getting the Gurkha soldier mentally attuned to the idea of having a planned operation on his chest for a chronic disease, particularly when it involves a journey across the world and removal of part of his lung. The difficulty was partly overcome by explaining to him that "we were all in the battle against the unseen enemy, the germ of tuberculosis, and that operation scars on the chest were really battle scars, the result of victory in the battle against tuberculosis". The language may strike the medically sophisticated reader as over-dramatic; but it is well understood by the Gurkha. The emphasis is on the partnership between the patients and the medical and nursing staff, and at no time is this partnership more important than in the treatment of a chronic illness like tuberculosis—at no time put to a severer test. The patients, on the one hand, must have a clear idea of the difficulties ahead and of the doctors' plans for overcoming them, and the doctor, for his part, must learn to appreciate the personal problems with which a long illness confronts his patients. The success of the Gurkha tuberculosis scheme reflects such a mutual understanding.

The first 21 Gurkha patients left Kuala Lumpur by air in June, 1957, for surgical treatment at the Army Chest Centre in this country at the Connaught Hospital at Hindhead. 8 were operated on during the following month and could return to Malaya by sea in October; and 7 were accepted for further service in the Army. Since then well over 100 cases have been provisionally accepted for surgery, almost all for partial lung resection; and at present about 8 are being operated on every month. The medical interest of this work is considerable. All but a few of those accepted for resection have had at least twelve months' uniform and carefully controlled chemotherapy; and bacteriological examination of the resected specimens has provided useful information with which to assess the value of chemotherapy in sterilising residual caseous foci.[2] Some apparently solid areas of caseous or fibrocaseous disease cleared after twelve months or more of chemotherapy—an observation of much relevance in deciding when to operate, if at all. Chemotherapy is continued postoperatively for at least twelve months.

Most of the patients are ultimately fit to resume their career in the Army: they are followed up and, when necessary, treated as outpatients. Those who return to Nepal receive three months' supply of drugs; and it is hoped that radiological follow-up will eventually be possible. Mackay-Dick also envisages help from the World Health Organisation: "a tuberculin skin-test survey of Nepal, with successful B.C.G. vaccination of all negative reactors, together with chemotherapy for all infants and children under three years (in the absence of evidence of tuberculosis) would be a great first step in the conquest of

1. Royal College of Physicians of London: Committee on Cardiology; report, October, 1958.
2. See *Lancet*, 1947, i, 873.

1. Mackay-Dick, J. N.A.P.T. Commonwealth Chest Conference, London, 1958.
2. Mackay-Dick, J., Slattery, D. A. D. *Brit. med. J.* 1958, i, 888.

tuberculosis in Nepal ".[1] Anyone acquainted with this mountainous country, where communications are poor and life rigorous, and where one doctor serves a population of 174,000, will appreciate the magnitude of this plan—but also, perhaps, its romance.

MALADJUSTMENT AND DELINQUENCY

THE relation of the delinquent act to " maladjusted " or disturbed behaviour has been a talking-point for many years. These two forms of reaction might be reasonably supposed to stem from similar stresses or provocations; indeed, it is easy to see them as different degrees of the same thing. Society at large tends to regard the problem as one of punishment and deterrence; and it is therefore important to know how far a delinquent is " normal but naughty ", and how far he is ill and needing treatment. Stott has put these ideas to the test in a study of probationers in Glasgow.[3]

He points out that in large cities the incidence of delinquency is usually high, but that within them are adjacent districts of high or low incidence. In some places a certain form of delinquency may be acceptable and expected (such as pilfering from Liverpool's dockland), whereas other illegal activities are subject to the taboos usual elsewhere. A stage of such delinquency in these circumstances can be regarded as " normal "; but Stott does not consider that significant antisocial behaviour is a universal episode in which an unfortunate few are caught. If this were so the areas of high delinquency where antisocial acts were the " done thing " should produce young criminals who were in other respects well adjusted. Conversely it would be expected that the occasional erring lad from a law-abiding district must be badly disturbed in other ways to rebel thus against the pattern of culture. Stott's figures did not bear this out. Although he found a very high positive correlation between delinquency and maladjustment, the degree of admixture was remarkably constant throughout his patchwork of good and bad areas. His results, using detailed teachers' ratings on the Bristol social adjustment guides, showed that stable youths made up 72% of 407 controls but only 24% of 417 probationers. 45% of the latter were definitely maladjusted, compared with 7% of the controls; and of all lads graded severely maladjusted there were 46 on probation, against only 2 controls. It seemed therefore that delinquency was an index of the factors producing maladjustment, and this was confirmed from a study of the controls: as was expected, a higher rate of maladjustment among them was found in localities where crime was rife.

This interesting work seems to support what many workers have long felt—that the line between the " ordinary " delinquent boy and the " psychiatric " one is hard to draw, and that psychological aspects are much neglected. Litauer [4] in his brief comparison of cases referred for psychiatric opinion with those not so referred did not discover any pronounced differences. Antisocial behaviour is in most, if not all, cases a symptom of some underlying disorder, a few aspects of which are becoming mistily discernible. Stott's work suggests, too, that immediate cultural influences are much less important than psychological factors in home and heredity. The influence of " bad company " has evidently been overstressed.

3. Stott, D. H. Interim Report on the Glasgow Survey of Boys put on Probation during 1957. Issued by the University of Glasgow, 1958.
4. Litauer, W. Juvenile Delinquency in a Psychiatric Clinic. London, 1957.

JAUNDICE AFTER INJURY

IT is now well established that serious injuries or extensive burns may lead to profound disturbances of metabolism, usually resulting in a net loss of nitrogen.[1] It is therefore hardly surprising that the liver, as the central metabolic organ of the body, should in such circumstances show evidence of dysfunction such as jaundice. 16 cases of jaundice brought about in this way have recently been reported from the Birmingham Accident Hospital by Sevitt.[2] Since in each patient the jaundice appeared within a few days after blood-transfusion, excessive hæmolysis due to blood-group incompatibility had to be excluded before the jaundice could be attributed to hepatic dysfunction. Fairly comprehensive serological examination failed to reveal any evidence either of incompatibility or of excessive intravascular hæmolysis. The transfusion of blood stored for over two weeks invariably leads to increased bilirubin production resulting from the breakdown of about 8% of the transfused cells within the first twenty-four hours.[3] This, as Sevitt has shown, can itself raise the plasma-bilirubin by 14 mg. per 100 ml. and must, therefore, constitute a considerable loading test for the excretory powers of the liver. While this load is readily dealt with when the liver is functioning normally, it may lead to clinical jaundice in the presence of impaired hepatic function.

Besides jaundice, the signs of a disordered liver were fairly conspicuous in all 16 patients. Thus the jaundice was usually preceded by pyrexia, nausea, vomiting, and pain in the right hypochondrium. Bile was invariably present in the urine; and the serum gave a direct positive van den Bergh reaction, indicating the presence of conjugated bilirubin. A moderate rise in the serum-alkaline-phosphatase confirmed that the jaundice was obstructive, and modest increases in thymol turbidity and zinc-sulphate precipitation in about half the patients suggested some parenchymal damage in addition. In the 1 fatal case the liver at necropsy was enlarged and swollen, and histological examination showed swollen parenchymal cells and compression of the sinusoids.

The processes underlying the hepatic disturbance associated with injury or burns are mainly circulatory. These circulatory changes lead to significant reduction in splanchnic [4] and hepatic blood-flow with consequent anoxia of the parenchyma. This results in a considerable uptake of fluid by the affected cells, often producing the picture of hydropic degeneration.[5] Apparently the mechanical effect of the swollen cells is the main cause of the associated jaundice, since the jaundice is obstructive with bile pigment in the urine and conjugated bilirubin in the serum. Presumably the rise in pressure within the liver, which is sufficient to produce the compression of the sinusoids seen at necropsy, could seriously embarrass the flow of bile along the intralobular canaliculi. If this is so, the proportion of conjugated to non-conjugated bilirubin in the serum will provide a rough measure of the relative importance of the obstructive and metabolic disturbances that underlie the jaundice in these patients.

Mr. ARTHUR JACOBS has been elected president of the Royal Faculty of Physicians and Surgeons of Glasgow.

1. Selye, H. Textbook of Endocrinology; p. 842. Montreal, 1947.
2. Sevitt, S. *Brit. J. Surg.* 1958, **46**, 68.
3. Mollison, P. L. Blood Transfusion in Clinical Medicine; p. 11. Oxford, 1951.
4. Abell, R. G., Page, I. H. *Surg. Gynec. Obstet.* 1943, **77**, 348.
5. Trowell, D. A. *J. Physiol.* 1946, **105**, 268.

Special Articles

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THE farsighted generosity of the Nuffield Provincial Hospitals Trust has made possible in the new town of Harlow the creation of a model health service, up to but excluding inpatient hospital care. This has involved nine new buildings:

Nuffield House, Sydenham House, Osler House, Addison House, Keats House	Health centres in function (but not in law), housing general and dental practitioners, and Essex County Council maternity and child-welfare clinics and priority dental services.
Edinburgh House	Industrial health centre.
Chadwick House	Specialist children's services for the whole town, provided for the county council by the regional board.
Galen House	Essex County Council child-guidance centre.
Bentham House	Temporary outpatient department for the regional hospital board, with "open access" pathology and X-ray units.

To complete the needs of the town in the future, one more local health centre and one more industrial health centre will be required, and for these the Trust has set aside the necessary capital. This, of course, takes no account of the Harlow Hospital itself, the construction of which has already begun.

In round figures, expenditure up to date has been:

Nuffield House	£24,000
Sydenham House	£24,000
Osler House	£12,000
Keats House	£32,000
Edinburgh House	£18,600
Addison House, Bentham House, Chadwick House, Galen House	£84,000
	£194,600

These figures include site costs, architects' and quantity surveyors' fees, and in most parts of the buildings furnishing and equipment. The final figure for the entire project is likely to be just over a quarter of a million pounds. To see this figure in proper perspective, it is worth noting that it is just over one-eighth of the cost of the future Harlow Hospital.

In this great undertaking, the Harlow Development Corporation has acted as managing agent for the Trust, and the buildings have been designed by the corporation's own architects or by nominated architects working under general corporation instructions. Ownership is retained by the Trust through its agency the Nuffield Health and Social Services Fund. All users (general practitioners, dentists, local health and education authority, regional hospital board, and industrial health service) pay rents of 6% of the capital cost, calculated on the basis of the floor area occupied; from these rents the Trust has to meet costs of landlord's maintenance, minor improvements, and building management. Thus the net return is something over 4% on the capital invested. Users pay for lighting, heating, cleaning, and the usual rate charges. They provide their own secretarial and ancillary help, but the Essex County Council allows the general practitioners to make use of the services of the home nurses, health visitors, and midwives in the centres, to their mutual benefit.

Three of the area health centres—Nuffield, Sydenham, and Osler Houses—have already been described.[1] In this paper, the remaining buildings, except Edinburgh House, will be dealt with.

How the Job Has Been Done

The Harlow health-services plan has been evolved step by step, starting with small-scale trials and embodying the lessons learnt at each stage. The fund of experience and wisdom available at Nuffield Lodge has guided the development, and special tributes must be paid to the vision and wise help of Mr. L. Farrer-Brown, the former secretary and now a trustee of the Nuffield Trust, and Mr. G. McLachlan, the present secretary of the Trust. At times of difficulty, and there have been not a few, their enthusiasm, encouragement, and advice have spurred on the project, and the difficulties have been overcome. As a result, the visitor to Harlow may today see the major part of a pattern of "extrahospital" health services for the future.

But nothing could have been achieved without the cooperation of the many individuals and statutory authorities concerned. The general practitioners and dentists are gladly accepting their new working conditions. They staff the county council's maternity and child-welfare clinics in the centres. They are paying rents above those generally obtaining in ordinary practice, to offer their patients the benefits of group practice in ideal premises in association with county council health services. Besides the county council, the Essex Local Executive Council has played its full part. Now the North East Metropolitan Regional Hospital Board and the Epping Group Hospital Management Committee are participating for the first time in the trial run of a small outpatient department, six miles from its parent hospital. This trial run should be of special value in assessing the growing outpatient needs of a new community.

The planning, building, equipping, and managing of these centres has been a combined operation. Almost every department of the Harlow Development Corporation has been involved—architecture, engineering, finance, legal, housing and property management, landscaping and gardening, public relations, and general administration. The greatest burden has fallen on the architectural and general administrative departments. No less than twelve

1. Taylor, C., Busby, J. C., Huntley, J. D., Meyrick, J., Findlater, A. G. C., Dyakowski, S., Keen, M. M., Bracewell, R. E., Robson, T. G., Stewart, G. G., Brown, F. G., Taylor, S. *Lancet*, 1955, ii, 863.

sketch plans were prepared for the Addison House group of buildings. Eventually, to keep its cost within the money available, its price was negotiated with the builders. There is no doubt that, in appropriate circumstances with contractors of repute and integrity, this is a better method of building to a low fixed cost than competitive tender.

The Harlow buildings are "block grant" buildings: that is to say, the Trust makes available a set sum within which the entire project must be achieved. This is excellent discipline. But it will work only if the agency (be it development corporation or any other statutory authority) is allowed to get on with the job, without having to refer every detail to the sponsoring authority (be it Nuffield Trust or Government department). This is the first great lesson which the health centres of Harlow have to teach. The Trust, true to its name, has trusted its agency and seen it through the inevitable errors and mistakes. The result has been far greater true economy and efficiency than meticulous control from the centre could have achieved. This experience may well have special relevance in the greater sphere of hospital planning and building.

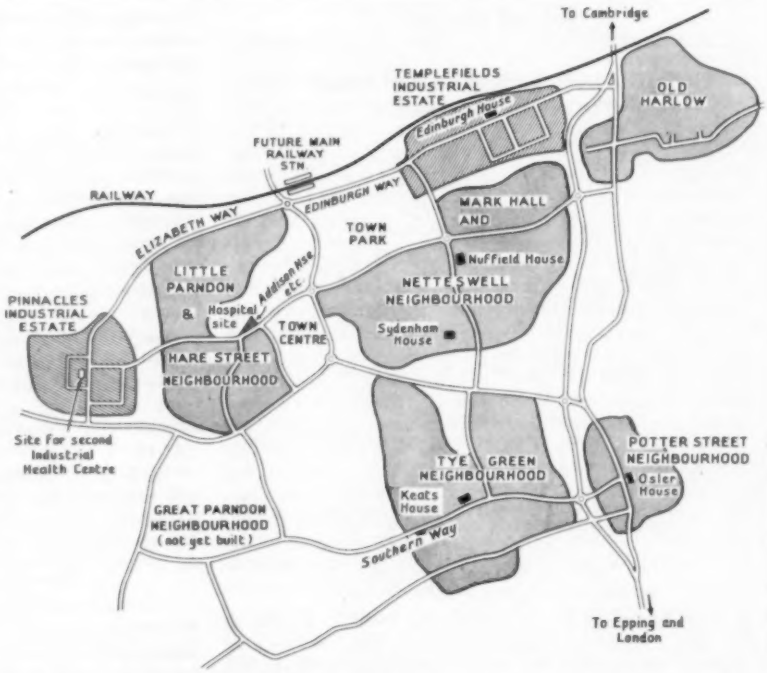

Fig. 1—Simplified master-plan of Harlow, showing the location of the Nuffield Provincial Hospitals Trust's centres in Harlow.

Behind such a project there must be an overall vision. But this is not enough. There must also be a careful study of function, and a meticulous attention to detail. Time and again a study of function will show that what users at first think they want differs from what they really need. The user who has to pay rent based on floor space occupied is far more economical, and far more ready to share what he has with others, than he who hopes to get the entire capital cost from some remote source. So throughout these buildings, multiple usage of space has been achieved whenever possible. Waiting-rooms have a double function, so that two or even three tenants may share the rent. The three consulting-suites in Bentham House will be used by eleven different specialties. Yet, at the same time, every room must have an individuality and character of its own. Our aim has been to escape from the old-style hospital atmosphere, giving instead an air of friendliness, like the best private consulting-room of the best general practitioner or specialist.

We have found that the more careful the pre-specification, the more effective is the work of the architect when he comes to put pencil to paper. Each of his plans must be scrutinised in detail by both users and administrators. If this is not done, over-provision creeps in for the sake of architectural tidiness, and costs creep up. Moreover, although the architect must realise requirements in qualitative terms, he cannot be expected to know the volume of usage. For example, he may see a corridor with four general practitioners' consulting-rooms opening off it as a busy corridor which must be wide because of constant traffic. Yet in fact even at peak working times it will not be traversed by more than one person every $1^1/_2$ minutes. Successful functional economy can be achieved only by the triple team of architect, user, and administrator.

In the final furnishing and equipment, attention to detail is no less important. Furniture must perforce be cheap, but it can still be well designed, durable, and friendly. Luxury and magnificence must at all costs be avoided. But beautiful curtains and pictures, plants and flowers, are not signs of grandiosity but rather of the loving care which gives a building its true character.

All these buildings have been planned and constructed without a coordinating or controlling committee. To have attempted to bring together repeatedly in one room the numerous people involved whenever a decision was required would have been physically difficult, and productive of much delay. Instead, one of us (T.) has acted as coordinator and ambassador-at-large or courier between the parties, with the staff of the development corporation always at hand to implement decisions. There is no secret in the personality involved, nor indeed in the absence of a committee. A chief officer of such a committee could have done the job just as well. But it seems to us essential that there must be one fairly senior person, with both medical and administrative experience, who is in a position to devote up to half his working time to dealing individually with all the parties concerned. This seems to us a method which might be equally effective in the building of a hospital. Half the salary of an officer with the status of senior administrative medical officer would be a minute sum in relation to the capital cost of a modern hospital. Of course he would have to learn his job. But the way to learn the art and science of health-service building is to do it, and to have enough time to do it, while at the same time keeping within a tight overall budget.

The Growth of Harlow

The picture of the growth of Harlow is best shown in a table.

	1950	*1955*	*1958*
New homes completed	98	6400	11,000
New population	400	22,000	37,000
Factories	—	54	69
Schools	—	7	20
Churches and church halls opened or reopened	—	4	10
Shopping centres:			
Town centre	—	—	1
Neighbourhood	—	1	3
Subsidiary	—	6	9
Community centres:			
Main	—	2	4
Tenants' commonrooms ..	—	8	12
Public houses	—	2	8

Including the old town of Harlow and the village of Potter Street, the population is now over 42,000, so that the town is more than half-way to its final figure of 80,000 (roughly the size of Cambridge).

A simplified version of the master plan of Harlow, indicating the location of the Trust's health-centre buildings, is shown in fig. 1. The Pinnacles Industrial Estate and the Tye Green neighbourhood are under development; the Little Parndon and Hare Street neighbourhood is nearing completion. The Great Parndon neighbourhood in the south-west of the town is so far undeveloped. The other areas shown are virtually complete.

The Town Centre Group of Health-service Buildings

This group of buildings is the centre-piece of the Trust's scheme. Originally it was called the Harlow Medical Centre, but this name was abandoned in deference to the reasonable wishes of the general practitioners practising in the other area health centres. It consists of four linked buildings, Addison House, Chadwick House, Galen House, and Bentham House, the last being two-storeyed.

It is customary for those who dislike the National Health Service as it is to bewail the trichotomy produced by the National Health Service Act of 1948. Without entering into this controversy, save to observe that bigness is not necessarily synonymous with efficiency or good administration, we can all agree that the trichotomy is something to be overcome at " patient " level.

In the Trust's first three health centres the gap between the general practitioners and dentists, working in contract with the local executive council, and the county council's services has been completely and successfully bridged. In the Addison House group of buildings we are attempting to bridge the remaining gap, or rather gaps, for here

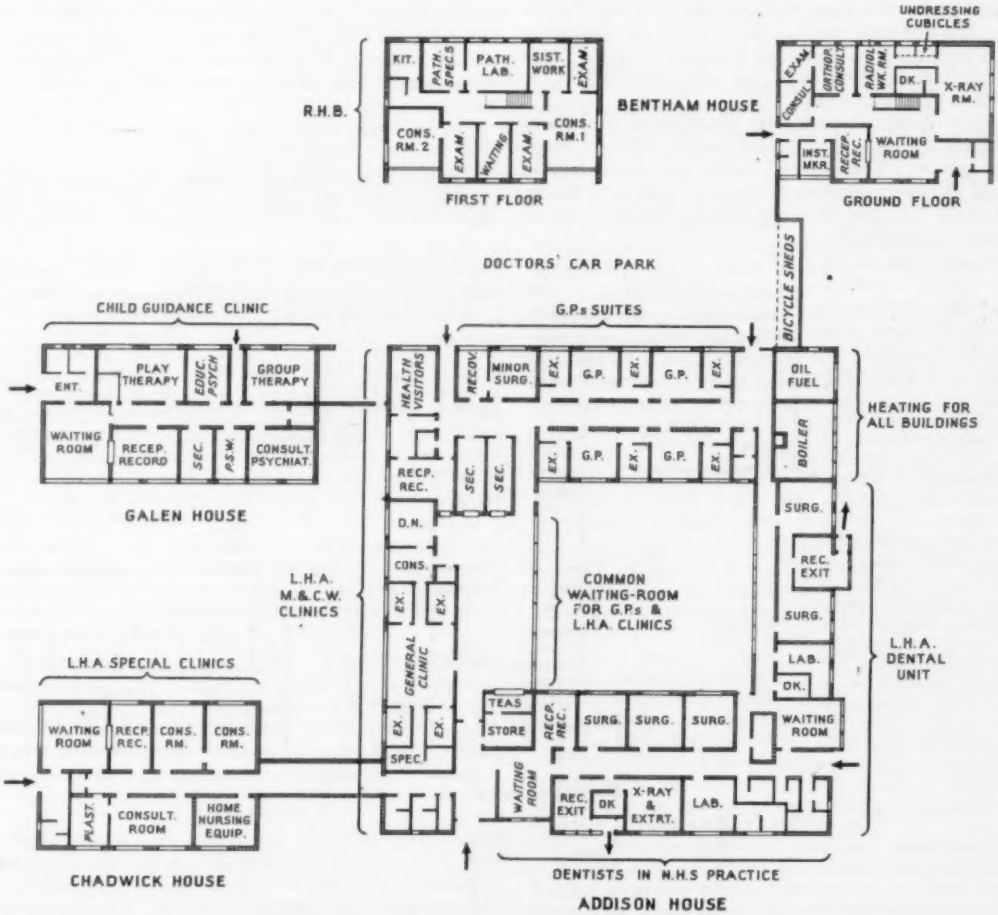

Fig. 2—Plan of the town-centre group of health-service buildings in Harlow.

Fig. 3—Exterior of Addison House, Chadwick House, and Bentham House, Harlow.

we bring in the county council's child-guidance centre as well as the regional hospital board's temporary outpatient department in Bentham House.

Thus the group of buildings is in fact a miniature picture of the whole National Health Service. Each part is physically close to the other yet at the same time physically quite distinct. Each of the four units in the group has its own clearly marked entrance. This is the more important since patients from general practitioners in other area health centres will be using three out of the four units.

There is no need to describe the building in detail: the plan (fig. 2) makes the layout quite clear. It consists really of eight parts—the four sides of the Addison House square, the two west wings, Galen House and Chadwick House, and the two floors of Bentham House. Very roughly, each of these parts has cost something over £10,000 to build and equip.

Addison House follows closely the plans of the earlier area health centres.[1] It is an area health centre for about 10,000 people. The general dental accommodation at Nuffield House has proved so successful that it is reproduced both here and at Keats House virtually without alteration, save the addition in each case of an extra dental surgery. The county dental units at both Addison and Keats House repeat the design at Sydenham House.

On the general-practitioner side, we have had to cater for two separate group practices. This was not originally envisaged. By contrast, at Keats House, we started with two separate group practices, to each of which a wing is allocated, while retaining a common waiting-room. In Addison House, each practice has a double consulting-suite with three examination rooms and its own reception office; but they share a common corridor. They also share a room for minor surgery and a recovery room. At Nuffield House the county authority allows its district nurse's room to be used for minor surgery, and the special minor surgery room at Addison House has yet to prove its worth. The provision of a third examination room between the two general practitioner's consulting-rooms has been found of special value for injections and dressings by the practitioners' own nurse at evening surgery.

The maternity and child-welfare clinic at Addison House is unusual in that it includes four examination-rooms for maternity work. At Nuffield House there are three curtained cubicles, but it has been found that the mothers welcome the additional privacy. Small folding tables have been found necessary, so that the doctors can write their case-records in each examination room as they go.

Chadwick House is a multi-purpose clinic for school-children's orthopædics, ophthalmics, orthoptics, and speech therapy. These specialist services are largely provided for the county by the regional hospital board. It also includes a room for home-nursing equipment for the whole town, with washing and sterilising facilities for returned items.

We hope that *Galen House* may prove to be a model child-guidance centre.

The playroom has been deliberately kept small, and this has been found to be an advantage, in that opting out of group games by the solitary children is impossible. A tiled recess

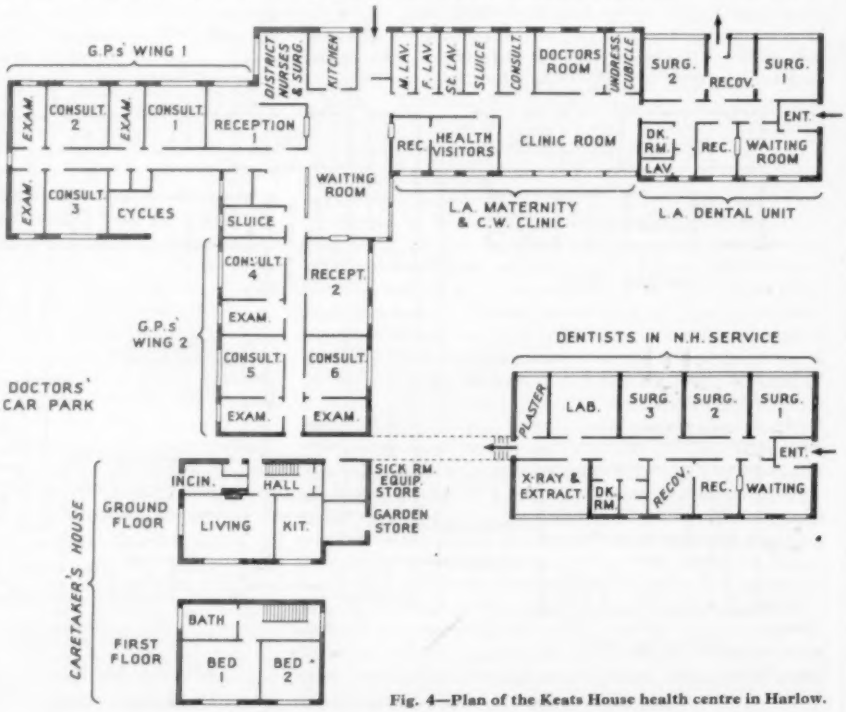

Fig. 4—Plan of the Keats House health centre in Harlow.

in the playroom contains a sink and two large sand trays; the whole recess can be swilled down into a floor drain. To avoid any feelings that the children attending the child-guidance clinic are " peculiar ", it has been decided to re-christen the clinic the " Galen House Centre ".

Bentham House must be one of the smallest and cheapest outpatient units ever built.

Its story is analagous to Haygarth House, the first temporary experimental health centre in Harlow.[2] Haygarth House was a two-storey building adapted to meet the needs of three general practitioners, two dentists, and the local-health-authority clinics. We knew from the start that it would soon prove too small. But by then it had done its work and proved its case. An ideal outpatient department, however small, should not be on two storeys. But necessity proved the mother of adaptation. And Bentham House really works. Bentham House was originally intended to accommodate open-access pathology and X-ray units, a branch of the Harlow Industrial Health Service to take care of the workers at the town centre, and a small administrative and research unit. But when the officers of the regional hospital board inspected the building they saw the possibility that it might be satisfactorily adapted to provide a temporary outpatient department pending the completion of the first stage of the Harlow Hospital on the site immediately north of Addison House.

The plan will make clear how Bentham House works. Its three consulting-suites are at present used for eleven consulting sessions per week:

General medicine	Thoracic medicine
General surgery	Neurology
Orthopædic surgery	Dermatology
Obstetrics and gynæcology	Ear-nose-and-throat surgery
Pædiatrics	Radiology
Psychiatry	

As with the earlier Haygarth House, we expect Bentham House to prove too small for its job within three years. But by then the new Harlow Hospital outpatient department will, we hope, be in operation, and we anticipate no difficulty in finding another use for Bentham House.

To keep down costs, a secondhand X-ray table and tube mounting were bought, for use with a new tube, transformer, and control panel. In this way, the total cost of the X-ray equipment has been kept within the £2000 allocated by the Trust.

Architecturally, the buildings are of considerable interest (fig. 3).

The problem was to create a long low building with no less than eleven separate entrances, and exits, in such a way that the patients would not become confused. Inside, there had to be a multiplicity of small rooms of varying sizes, all well lit and ventilated. The buildings had to look well, for they occupy one of the most prominent positions in the town, immediately north of the town centre.

To break up the long walls, a standard cedar panel was devised with a standard window, giving any degree of ventilation required; one or more of the window glasses could be opaque, where patients had to undress. Except in the waiting-room, large expanses of glass have been avoided.

By modern hospital standards, at £84,000 the building is very cheap. By Harlow standards it is comparatively expensive. This is entirely because it is equipped with oil-fired central heating. To keep within the price, pipes have not been ducted. This is a loss in amenity; but it has advantages in maintenance and repair.

Keats House

Keats House is an area health centre for about 17,000 people. It is situated immediately south of a main neighbourhood shopping centre, Bush Fair. Pending its completion, the doctors, dentists, and local-authority clinics which will work there have been temporarily accommodated in adapted houses.

The plan of the building (fig. 4) makes clear its internal arrangement. In essence, it is an enlarged version of the earlier Nuffield House. It will accommodate up to six doctors, four dentists in National Health Service practice, and the county-council maternity and child-welfare clinics and priority dental services. It also has a small house for a caretaker.

In terms of cost it is perhaps the most remarkable health-service building in the town. Nuffield House, for four doctors, two dentists, and the clinics, without a priority dental clinic or caretaker's house, cost £24,000. Keats House is costing £32,000. To keep to this figure, many economies have been made.

Throughout, the windows are standard English Joinery Manufacturers' Association types. Examination-room lobbies have been omitted. Waiting-room space has been reduced far below what we had previously thought necessary. Experience may show that the cutting here has been too drastic, and later modification may be needed; it all depends on whether the general practitioners and the clinics are able to work successful appointment systems.

Very careful costing has shown that central heating would be uneconomical. So heating is by electricity, and each tenant is separately metered.

Human Relations

The human relations between landlord and tenants and between tenant and tenant were exhaustively discussed in the earlier paper.[1] These arrangements have worked so well that no modification has been needed.

Each area health centre has an advisory house-committee on which sit the general practitioners and dentists, with representatives of the county health department, local executive council, and development corporation. The chair is always taken by a general practitioner. Experience has shown that during the first year the house-committee has to meet quarterly. Thereafter, annual meetings are all that is needed.

Experience has also shown that it takes two or three years, and much hard work, for a centre to reach full efficiency. We only learn to work together by actually doing so. We each retain our autonomy. The common link is the needs of the patient. We coordinate ourselves to meet those needs.

Conclusions

The final conclusions to be drawn from the Harlow experiment must await the effluxion of time. Our immediate conclusions are:

1. Good general practice in a town is essentially group practice. Group-practice centres cost more to build than individual surgeries attached to doctors' houses. But the advantages for both doctors and patients make the extra cost worth while.

2. Good practice involves the working together of the general practitioners, the dentists in National Health Service practice, and the local-health-authority clinics and staff. This cannot be fully achieved unless they are all working in the same building, while at the same time retaining their own autonomy.

3. The Nuffield Trust's health centres provide ideal conditions for achieving this good practice, at costs below conventional health centres. Provided loan capital is available, building is possible without subsidy.

4. The Harlow pattern has lessons to teach wherever new health-service building is contemplated, but it is specially suitable for large areas of new development. For full success the centres must be built in step with housing construction, the doctors must have no other place of practice in the town, and

2. Taylor, S. *Lancet*, 1952, i, 253.

there must be reasonable security against "extra-health-centre" competition for the doctors who enter the centres.

5. There is no need for such centres to lack individuality, humanity, and friendliness. In our experience, Harlow patients are delighted with what they find. Indeed, they often say they never imagined a visit to the doctor, the dentist, or the clinic could take place in such friendly and pleasant surroundings.

6. Free choice of doctor, and of centre, can, and indeed must, be retained. Ethical standards between groups and within groups must be of the highest. The inevitable strains between groups in separate centres which occur when practices are growing disappear as and when lists become substantial. But it has still to be proved that two group practices can coexist satisfactorily in one centre.

7. In a new and rapidly growing community, the needs for specialist services rapidly follow on the provision of adequate general-practitioner, dental, and clinic services. The need for so many of our patients to travel six miles for an X-ray or pathological examination or an outpatient consultation has become a severe strain on all concerned. We all welcome the opening of Bentham House, Chadwick House, and Galen House, especially the "open access" X-ray and pathological services. It is our hope that as a result the links between the general practitioners and the consultants may be as close and happy as those which have grown up between the general practitioners, the dentists, and the local-authority services. Only thus can true continuity of care be achieved.

8. We look forward to the day when our own Harlow Hospital will be in operation. Apart from what is now temporarily available in Bentham House, we need urgently a casualty department with emergency beds, especially for the thousands of children in Harlow; also a maternity unit to meet the needs of our thousands of expectant mothers.

In many places in Britain the people who use our health services are indebted to Lord Nuffield and his trustees and officers. Nowhere is this debt greater than in the new town of Harlow. Thanks are also due to:

The successive chairmen and members of the Essex County Council, particularly the present and immediate past chairmen of the county health committee, Alderman Mrs. M. Ball and Alderman K. E. H. Glenny, O.B.E.; the officers of the health and education departments of the county council, especially the health visitors, midwives, and home nurses, and their superintendents, and the staff of the Galen House Centre.

Sir Graham Rowlandson, the chairman, the members, and officers of the North East Metropolitan Regional Hospital Board; and especially their secretary, Mr. C. E. Nicol, O.B.E.

The chairman, members, and officers of the Epping Group Hospital Management Committee and their Medical Advisory Committee, and especially the management committee's secretary, Mr. A. J. Cole.

Mr. H. E. Bates, the chairman, and the members of the Essex Local Executive Council; especially Dr. H. N. Rose and Mr. E. Bergdahl, the secretary, who serve on our house-committees.

The chairman, members, and officers of the Harlow Development Corporation; especially the general manager, Mr. B. Hyde Harvey, Mr. J. R. Jacques, solicitor to the corporation, Mr. G. D. Bratt, chief finance officer, and Miss J. B. Payne, who has been responsible for all detailed administration of the project.

The architects. For Addison, Bentham, Chadwick, and Galen Houses, the corporation with Mr. A. McCowan, A.R.I.B.A., and Mr. D. G. Fenter, A.R.I.B.A., in charge. (The architects for the Harlow Development Corporation are Mr. F. Gibberd, C.B.E., F.R.I.B.A., architect planner, and Mr. Victor Hamnet, A.R.I.B.A., executive architect.) For Keats House, Messrs. Booth, Ledeboer, and Pinckheard, FF.R.I.B.A.

The contractors: W. & C. French, Ltd., and Holmes Brothers, Ltd.

BREAST CANCER

COMPARISON OF RESULTS AT MAYO CLINIC AND IN EDINBURGH

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IN two recent communications [1 2] from the Mayo Clinic, the results obtained in breast cancer at the Mayo Clinic and in Edinburgh have been compared. As Crile [3] has pointed out, the great superiority of the results claimed by the Mayo Clinic authors depends on their basis of comparison:

Comparison made by Mayo Clinic authors

Mayo Clinic	*Edinburgh*
All cases treated by radical mastectomy	All operable cases *plus* All locally advanced cases
All cases not treated by radical mastectomy	All cases with distant metastases
Total cases	Total cases

In the Edinburgh publications [4 5] the value of treatment has been assessed on a fundamentally different basis from that adopted by the Mayo Clinic. Which method of assessment is best need not be discussed here, but it is important to appreciate that different things have been measured and that direct comparison is impossible.

In Edinburgh we have attempted to measure the survival-rate of all patients who develop breast cancer in South-East Scotland, irrespective of the extent of the disease and irrespective of the general health of the patient. The Mayo Clinic publications, on the other hand, present the survival-rate of only those patients who were treated by radical mastectomy.

1. Berkson, J., Harrington, S. W., Clagett, O. T., Kirklin, J. W., Dockerty, M. B., McDonald, J. R. *Proc. Mayo Clin.* 1957, **32**, 645.
2. Berkson, J., Harrington, S. W., Clagett, O. T., Kirklin, J. W., Dockerty, M. B., McDonald, J. R. *Lancet*, Sept. 6, 1958, p. 516.
3. Crile, G., Jr. *ibid.* 1958, i, 739.
4. McWhirter, R. *Proc. R. Soc. Med.* 1948, **41**, 122.
5. McWhirter, R. *Brit. J. Radiol.* 1955, **28**, 128.

Because the Mayo Clinic results (Harrington 1946) [6] were limited to such cases, the following statement was made in the 1948 communication [4] from Edinburgh.

"One of the best-known and most reliable series in the literature is that of Harrington of the Mayo Clinic. His figures probably represent the best results obtainable by surgery in a large number of cases. Unfortunately the extent of selection is not indicated and it should be noted that only treated cases are included. Some degree of selection may be presumed . . .". Patients treated by radical mastectomy must be selected; it would be wrong not to do so. The Mayo Clinic results were therefore based on selected cases. This is a statement of fact. It does not imply, and was not intended to imply, any reflection on the Mayo Clinic.

OBJECTIONS TO THE COMPARISON

Because the value of treatment has been assessed on a different basis, no attempt was made in the Edinburgh communication [4] to carry the comparison further. The Mayo Clinic authors, while recognising that comparisons are always difficult, have proceeded, nevertheless, to make such a comparison.[1 2] In doing so they seem to have misunderstood certain points:

1. *The basis of subdivision into categories is different in the two centres*

The Edinburgh cases are subdivided according to the clinical extent of the disease found at the original examination and this is the only factor determining the category to which a patient is assigned. Three categories are recognised:

1. "Operable."
2. "Locally advanced."
3. "Distant metastases."

In all our communications the extent of disease present in each category is clearly defined.

The Mayo Clinic cases are subdivided according to whether or not they were treated by radical mastectomy. Two categories are recognised:

1. Cases treated by radical mastectomy.
2. Cases not treated by radical mastectomy.

The criteria of operability are not presented in any of the communications.

6. Harrington, S. W. *Surgery*, 1946, **19**, 154.

2. *The definition of the "operable category" in the Edinburgh series is widely accepted*

The standard of operability adopted in Edinburgh (Manchester stages I and II) is widely accepted in this country and does not appear to differ greatly from the standard in other countries. Where a difference does occur, the criteria elsewhere are generally more strict. It is of interest to note that in the staging proposed at the International Cancer Congress this year [7] the operable group of cases are more strictly defined.

3. *Patients in the "locally advanced category" are too advanced for treatment by radical mastectomy*

The "locally advanced" category was defined [5] as including all patients too advanced for radical mastectomy by reason of:

1. Complete fixation of the primary tumour to the pectoral fascia or to the ribs.
2. Fixed axillary nodes.
3. Enlarged supraclavicular nodes.
4. Widespread involvement of the skin over the breast.

I am unaware of any centre in which patients with disease of this extent are routinely treated by radical mastectomy. When the comparison first appeared [1] I felt so sure that an error had been made that I wrote to Dr. Berkson and drew his attention to the definition and enclosed three photographs (figs. 1–3) to show how extensive the disease might be in patients in this category.

Fig. 1—Primary tumour fixed to pectoral muscle and ribs. Treated by radiotherapy alone.

Though their disease is too extensive for treatment by radical mastectomy, some patients—especially those with fixed axillary nodes and palpable supraclavicular nodes—may still be treated by simple mastectomy and radiotherapy. This was one of the advantages claimed for treatment by simple mastectomy and radiotherapy.[4 5] It does not follow at all that these advanced cases, merely because they have been treated, must be included when comparison is being made with patients treated by radical mastectomy.

4. *The average extent of the disease in patients treated by radical mastectomy at the Mayo Clinic may not be greater than that usually accepted*

Because they do not state their criteria of operability, it is impossible for an independent observer to tell whether the Mayo Clinic patients treated by radical mastectomy are less advanced or more advanced than the patients in the "operable category" in the Edinburgh series.

The Mayo Clinic authors say: "We believe that we perform this operation regularly with patients who would be placed in this category" [2]; but this indefinite statement does not enable us to determine precisely how many locally advanced cases were treated by radical mastectomy. Clearly not all were so treated, for in the more advanced cases such as those illustrated in figs. 1–3 radical mastectomy would be a technical impossibility.

7. Clinical Stage Classification and Presentation of Results. Malignant Tumours of the Breast and Larynx; p. 22. Paris, 1958.

Fig. 2—Extensive primary with ulcerating fixed axillary mass of nodes. Treated by palliative radiotherapy.

Such locally advanced cases as were included may be completely counterbalanced by a group of cases (grade I, without axillary metastases) with a remarkably high survival-rate—a survival-rate actually higher than that quoted for the normal population:

Survival-rate of the normal population compared with the survival-rate of carcinoma of breast grade I, without axillary metastases (from Proc. Mayo Clin. 1957 [1])

	5 yr.	10 yr.	15 yr.
Normal population . .	About 91%	About 82%	About 69%
Carcinoma of breast grade I without axillary metastases	95·5%	87·0%	75·7%

It is noteworthy, too, that the proportion of operable cases with positive axillary nodes has been falling progressively and is now under 50%.[1] This finding in itself suggests that the criteria of operability at the Mayo Clinic are reasonably high and probably not greatly different from the criteria adopted elsewhere. If this assumption is wrong, then, as Mackenzie [8] has suggested, "the radical operation is being restricted too severely in other centres, and all surgeons dealing with mammary cancer will need to reconsider their criteria of operability. In view of accumulated experience of the survival figures in such cases elsewhere, they are unlikely to do this unless the Mayo Clinic workers can produce figures giving the numbers of cases in the 'operable' and the 'locally advanced' groups (as defined above) in their series, with the corresponding survival-rates for each group."

5. *The survival-rate for each category in the Edinburgh series is presented without any deductions whatsoever*

As already noted, the patients in the Edinburgh series were assigned to categories according to the extent of the disease as clinically determined. This subdivision of patients into groups with disease of comparable extent is of value for a wide variety

8. Mackenzie, I. *Lancet*, 1958, i, 1174.

Fig. 3—Note extensive involvement of skin lymphatics. Treated by palliative radiotherapy.

of purposes. Nevertheless, the treatment of each patient still requires individual consideration. As the following figures show, the method of treatment is not automatically determined by the assignment of a patient to a clinical category (see Treatment Policy [5]):

Treatment given to patients in the "operable" category

Simple mastectomy and full radiotherapy	81%
Radical mastectomy	6%
Incomplete treatment or no treatment at all	13%

It will be noted that not all the patients were treated by simple mastectomy and radiotherapy.

Radical mastectomy was performed in stout patients, in patients with pulmonary tuberculosis, in patients with peripheral vascular disease, and in patients where there was no clear line of demarcation between the primary tumour and the axillary nodes.

In 13% of the patients the treatment was either incomplete or no treatment at all was given. In the attempt to collect the records of all patients many elderly ones were included. The intercurrent diseases so commonly associated with old age often made it necessary to restrict the radiotherapy to a few days. Some patients were treated by simple mastectomy alone and some by radiotherapy alone. In patients over 80 years of age, and in those with the most advanced intercurrent disease, no treatment at all was given.

For the reasons given (see Results of Treatment Policy Adopted [5]) the results presented are those of the treatment policy as a whole—i.e., they represent the survival-rate of all the patients in the "operable category"—not the survival-rate of the treated cases alone.

6. *Direct comparison of the total cases in the two series cannot be made because of the marked difference in the proportion of early and advanced cases*

Because of the difficulties inherent in comparison by stages of advancement, I have suggested that comparison of the survival-rates of the total cases may have some advantage. I also make it quite clear that "total cases" refer to all cases occurring in a geographic region.

We have attempted, in Edinburgh, to measure the survival-rate of all patients in South-East Scotland who develop breast cancer. In practice this has meant the survival-rate of all patients referred to hospital. The hospitals in South-East Scotland meet the total hospital needs of the population. I appreciate that the Mayo Clinic patients are drawn from a very wide area and that the Mayo Clinic does not attempt to meet the total hospital needs of any geographic region. It is a specialised clinic, not a general hospital, and therefore cannot provide the survival-rate of the "total cases" in the sense indicated in the Edinburgh communications.

The question then arises whether the patients referred to the Mayo Clinic are fully representative of the total cases occurring in any geographic region of the United States. It would be reasonable to presume that patients are referred to the Mayo Clinic only if the possibility of radical mastectomy arises. Some more advanced cases may be referred but one would expect this number to be small. It is therefore not surprising that 84% of the patients [1 2] referred to the Mayo Clinic were actually treated by radical mastectomy. In the Edinburgh series [5] 56% of the patients were placed in the "operable" category and this is in good agreement with the findings in other large general hospitals in this country. If the high operability-rate of the Mayo Clinic obtained generally throughout the United States one would expect to find that the mortality from breast cancer was considerably lower in the United States than in this country. In fact there is no appreciable difference. This suggests that favourably selected cases are referred to the Mayo Clinic.

Among the Mayo Clinic patients who were not treated by radical mastectomy, presumably there were some with limited disease who did not have treatment because of age or intercurrent disease—i.e., patients who would have been placed in our "operable" category in Edinburgh. Some presumably would have been included in our "locally advanced" category. Nowhere in the Mayo Clinic communications is it stated that all the patients who were not treated by radical mastectomy had distant metastases. If the extent of the disease in the untreated patients could be stated this would help in determining the degree of selection in the cases referred to the Mayo Clinic.

SUMMARY OF OBSERVATIONS ON THE MAYO CLINIC BASIS OF COMPARISON

If the Mayo Clinic authors had limited the comparison to that made in the following table they would still have been comparing to their advantage:

Mayo Clinic	*Edinburgh*
All cases treated by radical mastectomy. Five-year survival-rate excluding hospital deaths and untraced cases = 59·3%	All patients assigned to the "operable category". Five-year survival-rate without excluding any case for any reason = 58%

Their insistence on including all patients in the "locally advanced" category, when comparing the Edinburgh results with their results from radical mastectomy, is justified only if they will state quite specifically that it is the policy of the Mayo Clinic to perform routinely a radical mastectomy in *all* patients with:

1. Complete fixation of the primary tumour to the pectoral fascia or to the ribs.
2. Fixed axillary nodes.
3. Enlarged supraclavicular nodes.
4. Widespread involvement of the skin over the breast.

If, in fact, they do so, it will be very important that they should also state the number of patients in this category so treated and the survival-rate obtained.

Unlike the total cases in the Edinburgh series, the Mayo Clinic total is not representative of all the cases of breast cancer occurring in a geographic region. Comparison of the survival-rate of the total cases in the two series is therefore misleading.

SOME SUBSIDIARY OBSERVATIONS

". . . his arguments have undermined confidence in radical mastectomy." [2]

Many surgeons over many years have expressed disappointment with the results from radical mastectomy. In particular, they have been disappointed when the axillary nodes were involved—i.e., when the value of axillary dissection is really under test. Demonstration of the frequency of invasion of the internal mammary nodes has further undermined confidence in radical mastectomy. Handley, Patey, and Hand [9] express what must be a widely held belief when they say: "The classical radical mastectomy, which takes account only of the axillary system, is therefore foredoomed to failure in one occasion in three by reason of its neglect of the internal mammary nodes".

The Mayo Clinic authors appear to suggest that it is wrong to recognise the defects of radical mastectomy. Spread to the internal mammary nodes, as a factor calling for extension of the field of treatment, they dismiss as a "theoretical consideration"!

In 1948 I pointed out [4] that 40% of the total cases reported by the Mayo Clinic had negative axillary nodes. The Mayo Clinic authors, commenting on this statement, go on to say: "In fact, the choice of this statistic as evidence of 'selection', proved to be an unhappy one [2]" &c., and note from my 1955 communication [5] that patients treated by radical mastectomy in Edinburgh prior to 1941

9. Handley, R. A., Patey, D. H., Hand, B. H. *ibid.* 1956, i, 457.

also showed the same proportion of negative axillary nodes. Both statements refer to patients treated by radical mastectomy, and there can be nothing "unhappy" about the fact that the axillary nodes were equally involved in the two series of cases.

> "McWhirter did not compare his results with those of contemporary treatment by radical mastectomy." [2]

The authors should note table XIII in the 1948 communication.[4]

It was natural that comparison should also have been made with the period 1935–40 when radical mastectomy was the main method of treatment practised in Edinburgh. While agreeing that gradual improvement has been a feature of the results reported by most centres, I would point out that the results for 1941–45 [4] showed a marked improvement and that this improvement exactly coincided with the introduction of a new method of treatment. (The improvement was *not* "independent of change of treatment".[2]) That the change in the method of treatment played some part in the improvement is supported by the observation that over the next five years (1946–50), when the method remained unchanged, the survival-rate did not show a further marked improvement (the survival-rate of the total cases in 1946–50 is 44%).

The Mayo Clinic authors [2] take exception to the following statement: "Thus as the limitations of radical mastectomy become more clearly recognised, it has become customary to restrict the operation to early cases . . ." Table 3 in their 1957 paper [1] provides strong support for its accuracy. Of the patients treated by radical mastectomy, the proportion with axillary metastases fell from 66 to 47·6% over the period studied. The only conclusion possible is that in recent years radical mastectomy has been carried out in less advanced cases.

The Mayo Clinic authors express some doubt about their analysis establishing "definitely that radical mastectomy has a higher survival-rate than simple mastectomy with irradiation".[2] The general tenor of their paper certainly implies that they believe that radical mastectomy is better. They then repeat the statement that "McWhirter missed an opportunity to initiate a controlled clinical trial . . ."[2] In 1941, when treatment by simple mastectomy and radiotherapy was under consideration, I suggested to the surgical staff of the Royal Infirmary that alternate cases should be so treated and that radical mastectomy should be continued in the other cases. Control clinical trials were not commonly practised at that time and the surgeons decided not to adopt a controlled trial.

Read in the light of what has now been said, the penultimate paragraph of the recent paper [2] appears to be a remarkable condemnation of the comparison actually made by the Mayo Clinic authors. They presented their results "but only for the properly 'selected cases'"—i.e., the cases selected by them for treatment by radical mastectomy.

AN AGREED SYSTEM

Enough has been said, and I will make only one further observation. The misunderstanding which has arisen urgently draws attention to the need for an internationally agreed system of staging of breast cancer. Comparison by stages admittedly has its faults, but if the Mayo Clinic and the Edinburgh patients had been staged in the same manner this misunderstanding would almost certainly have been avoided.

Symposia

NATURAL SELECTION IN MAN

THE newly formed Society for the Study of Human Biology held a symposium in London on Nov. 8.

Prof. L. S. PENROSE told the meeting how some earlier geneticists had been anxious lest Man's avoidance of natural selection should lead to loss of fitness. Karl Pearson, for example, after arguing that "Socialism does not necessarily produce deterioration", had second thoughts, and considered that only active eugenic measures could save Man from deterioration in civilised communities. Interest was now centred on less ambitious and more practical issues. The questions asked were: What genes can be recognised? What are their effects? How did they get there? What are their frequencies? Are these frequencies changing or are they stable? How do the genes affect socially significant qualitative traits? Many effects of single gene loci could now be recognised—for example, by serological techniques, and the electrophoresis of serum-proteins. The alleles at these gene loci were assumed to arise by mutation, though this had not yet been directly observed for any of the genes determining the blood antigens. Many gene frequencies appeared to be fairly stable, and this required explanation.

The first mathematical geneticists to consider this problem had assumed that natural selection tended to favour the survival of one allele at the expense of the others; and that all the population tended to become homozygous for this allele, while the others were kept in the population only by mutation. Mutations, however, were rare, and yet Man was polymorphic for many gene loci—that is, there were two or more alleles all common in the population for these gene loci. (Dr. P. M. SHEPPARD later noted that such polymorphism for the genes in the ABO antigens and the ability to taste, or not to taste, phenyl-thio-urea probably antedated the appearance of Man as a species, since similar blood antigens were found in the chimpanzees, and it had been claimed that chimpanzees, too, could be divided into "tasters" and "non-tasters.") The best explanation for such polymorphism, Professor PENROSE thought, was heterozygote advantage: that for a pair of alleles "A" and "a", the individual who had the genotype Aa had a selective advantage over either AA or aa. This would give a stable equilibrium, and would maintain, for example, a considerable frequency of gene "a" in the population even where the homozygous condition was lethal as in fibrocystic disease of the pancreas.

Turning to quantitative characters, Professor Penrose noted that for characters such as height and intelligence there was a great deal of variability in the population which could not be ascribed wholly to differences in environment. There must be mechanisms which preserve this variation. Mutation to genes leading to phenotypes deviating from the average of the population would be one mechanism, but by itself would be somewhat crude. Once again heterozygote advantage would provide an explanation, the heterozygotes being near the average of the population and also having the greatest fitness, while the homozygotes at the extremes of the range of variation were relatively unfit. Such a mechanism would provide much variability, and would also be well buffered against change by selection.

Finally, Professor Penrose noted that there was probably considerable natural selection still occurring in Man, but that it operated in the main before birth. Some 15% of zygotes, and possibly more, aborted; some 3% of the remainder were stillborn; some 5% of the remainder died in infancy or early childhood; some 20% of the remainder remained unmated; and some 10% of the remainder were sterile.

The later speakers were mostly amplifying and developing points which Professor Penrose had introduced. Dr. SHEPPARD discussed some of the polymorphisms in Man. He noted that E. B. Ford as early as 1943 had prophesied that the ABO blood-groups and the ability to taste phenyl-thio-urea would

be found to have some relation to disease. Now the association between group A and cancer of the stomach, and group O and duodenal ulcer, had been found. More recently the association between non-secretion of ABO specific substances into the saliva and duodenal ulcer was discovered. Recently in Liverpool they had been able to confirm that the trait of tasting phenyl-thio-urea was related to thyroid function. Among patients with nodular goitre they found an excess of "non-tasters", while in patients with diffuse goitre they found an excess of "tasters". The selective advantages of genes might be complicated. Thus ABO incompatibility between mother and fœtus protected the child against rhesus incompatibility. Dr. Sheppard doubted, however, whether the associations with disease were sufficient to account for the polymorphism for the ABO and "taster" gene-loci. He suggested that heterozygote advantage should be looked for. The claim that MN children were more frequent than one would expect from the parental gene frequencies should be reinvestigated. In chickens such heterozygote advantage for blood-type antigens had been found, and he considered it likely that such advantage existed also in the rabbit.

Dr. C. A. CLARKE described methods of measuring the fitness conferred by individual genes in Man. This was most simply done for rare dominant genes, where it was possible to find all those affected in a population and actually observe their reproductive performance. Such surveys had been carried out for achondroplasia, and it had been shown that the fitness of achondroplasics was low. It was difficult in estimating fitness in this way to know which to take as controls. It was probably best to take the brothers and sisters of those affected, since these resembled the patient in social class and other variables. Dr. A. C. STEVENSON, on the other hand, thought it best to take the average of the population. Turning to recessive genes, Dr. CLARKE noted that no useful estimates could be made till it was possible to recognise those heterozygous for these genes. It was the effect on fitness of the relatively numerous genes in the heterozygotes, rather than the few in homozygotes, that was important. Fortunately, it was becoming increasingly possible to recognise the heterozygotes.

A visitor from the United States, Prof. TH. DOBZHANSKY, had described at a meeting sponsored by the Ciba Foundation the previous evening how the same problems arose in the fruit fly. Wild populations of these animals were found to possess astonishing genetic variability. In a study of a wild population of *Drosophila pseudobscura* he and his colleagues had shown that 33% of chromosome II, 25% of chromosome III, and 26% of chromosome IV were lethal in the homozygous state. At the symposium he was concerned with the action of natural selection in building integrated genetic systems. He too favoured heterozygote advantage as the best explanation of the way in which genes harmful in the homozygote were maintained in the population.

Dr. A. R. G. OWEN, a mathematician, showed, however, that if heterozygote advantage was assumed to exist the mathematical requirements for a stable system of gene frequency become complicated as soon as more than two alleles at a single gene locus are considered. With three alleles, for example, not only must all heterozygotes be more fertile than the homozygotes, but also certain relationships of the fertility of the heterozygotes themselves were needed for stability. The more alleles that were present, the more rigorous were the conditions needed for the stability of the gene frequencies. He had not yet attempted to define the conditions of stability where there was interaction between more than one gene-locus.

Finally, Dr. E. H. ASHTON gave an account of evolutionary change in a primate, the African green monkey. A colony of these animals had become established on the island of St. Kitt's in the West Indies some three hundred years ago and already showed considerable differences from the African stock. He was not able to say, however, to what extent these differences were due to a direct effect of the environment, and to what extent they were due to genetic change.

In England Now

A Running Commentary by Peripatetic Correspondents

"A CAR," said the recorded voice, "for every family in the country and roads for them to go on." Golly! as the Homeric heroes used to say, what a word flew out through the barrier of his teeth. Is there not a law, valid as that of Newton, if not of Parkinson himself, that where x = value of car to family, y = number of families in country, and z = number of family-cars, then as z approaches y so x approaches zero. I hope that is clear, though I feel sure it could be better expressed.

Take it another way and let X be the number of f-c's now and x the number at any other date; then when x was X/20—say 30 years ago—f-c took its f into the country of a Sunday morning, spent the day browsing on a grass verge, while the f walked the lanes and footpaths and picnicked in a bluebell-wood and in the evening took them at its own pace 15 or 20 miles home. In those days it was worth its oats. 10 or 15 years later, with x at X/10, though the family could reach its bluebell-wood at no greater cost than an early start, the return, whether with or against the tide, was intolerable, cancelling out the day's happiness, so *that* was off.

Time was when the f-c was a convenient means of transport to theatre, shop, or concert-hall in town. Not now. Paterfamilias himself no longer attempts to drive to a consultant's door but parks in Regent's Park. Soon that too will be full. Once or twice a year, at a carefully chosen day and hour, the f-c may set wheel for the far west country with a light heart, but for the rest, now that x = X, the f-c, at least for the Londoner, seems to me to have had it. How *a fortiori*-er will it have taken the knock when x = 10X—or whatever may be saturation point.

Ah, but "roads for them to go on". Universal subtopia? No, Mr. G. No. But what *is* the poor chap to say? A bubble-car *per* family and the roads left alone (after all some very lovely ones do still remain)? A car for 1 family in 20, picked by lot from an enormous national hat, and a permanent "temporary surface" for all roads? A car for every family in the country and driving and parking regulations of such ferocity that all will remain constantly stabled? No cars at all but invalid chairs, push-bicycles, scooters, roller-skates, and walking shoes for those fit to use them and railways for the rest? *Qui vivra verra;* meantime we move either towards the last great jam (and may I be there to see) or replacement of the last road by a motor-track (and may I be comfortably dead long before).

* * *

My scythe is a new one compared with that of my peripatetic colleague (Nov. 1). Like his it was bought in a local town, and, though the blade bears a Sheffield name, on the haft stand the words "Made in U.S.A.". But this is perhaps appropriate, for in order to learn how to use a scythe I had to go to the U.S.A.

* * *

Only a deep sense of duty forces the Cambridge G.P. to do his rounds on Poppy Day. For weeks before he broods anxiously and tries to fix his visits so that he can stay at home on that day. Of course it never works, and out he has to go, to face the fervour, frenzy, and folly of ruthless undergraduates.

This year once more I had to face the fantastic hazards of the streets—hazards never dreamed of by the Institute of Advanced Motorists. I could not pass the portable zebra crossing, a painted carpet strip with mobile belisha beacons, without paying. A highwayman on horseback, in full costume and pistols, proved just as demanding. So did the artistic monkeys who sat in the gutter of Bridge Street and painted the kerbsides. It was a pleasant change to get caught behind a lorry holding a lady in her bath, but then I nearly collided with Mehitabel. This was an ancient car chuffing round and round the Market Place, ready to be won by him who guessed how often it could circle on a single gallon of petrol. (Cantabs may like to know that the answer was 69.)

Yet the traffic jam I shall remember longest was the moment when I got stuck between a lovely lady undressed in red silk

à-la-Dors-Monroe, a steam tractor with a shrieking siren, a girl in a cushioned punt, and a dragon. The dragon was impressive; he went on and on, his green sinuous body covering countless legs (flannel-trousered) beneath. After suddenly entering Woolworths and curving his way up and down stairs, he came out again to lie down across the road, head in one street and tail in another.

Doctors were not, of course, the only sufferers. An Addenbrooke's nurse was seized by slave-traders; she made a break for it and almost got away, but one tough ruffian recaptured her. (They grab the girls with a net.) Her mortification at being put up for public auction was worsened when he knocked her down for fivepence. That night (the kind of coincidence which happens only in real life) he was admitted to Addenbrooke's with concussion. He is doing well, I understand, but one of his nurses is considering whether a little extra treatment might not help.

• • •

Firework night down Lambeth Way went off successfully once again. Careful census of children round about 9 P.M. revealed the correct number of eyes and ears. It's the first time the weather has been really kind to our family since about a year ago last July. Despite a foul forecast it cleared nicely as the sun went down, and out we flooded with our golden rain and flying-saucers. Social status rises towards the end of our mews, and the few houses up our end, in collaboration, produced the largest and most garnished bonfire. It boasted among minor attractions a sofa, two armchairs, a pram, a sideboard, about three tables, two doors, and innumerable smaller pieces of decadent and unrecognisable pieces, and, of course, carefully hoarded rubbish dating back several weeks. The ash will go round all our diminutive back-gardens. This great and impressive mound of flame and fury (we forgot to put the guy on until it was almost out) attracted the delinquent element from the lower reaches, and after a couple of thrown bangers they were sternly ordered off—by me I'm afraid, conscious though I was of their need for play-therapy, self-expression, indulgence, and all that, but blow it one must be oneself sometimes. It was a triumph for the good behaviour of the remaining 15-odd kids milling round in a small space, with sparklers and long things marked " may be held carefully in the gloved hand ", that not even a scarf was singed. The delinquent elements, relegated to another blaze, managed to catch one member's trousers alight, to the extreme amusement of witnesses and occupant alike.

It was a year of experiment and we tried a number of two-stage rockets, though our firing mechanism for the second stage proved every bit as tricky as the Americans'. The wind blows the match out while you move from fuse to fuse, or else the wrong stage fires first—very discouraging. Success crowned our efforts with the very last two rockets, but in the absence of an announcement from Jodrell Bank we must assume it, too, failed to reach the moon.

• • •

SIR,—My friend Mr. Bob Sawyer has drawn my attention to the article by Dr. Berlyne, in your issue of Nov. 1 (p. 939). I have been not a little worried about my health since rumours reached me of the paper by Burwell et al.[1] and I am greatly reassured to know that Dr. Berlyne has decided that I do not suffer from the cardiorespiratory syndrome of extreme obesity. The article has, however, caused me some embarrassment in its reference to Dingley Dell as *my* house. Manor Farm, Dingley Dell, is the home of my very dear friend Mr. Wardle and I am sure that I have never knowingly given anyone the impression that I own that admirable establishment. That I often look upon Dingley Dell as my " second home " is but a tribute to Wardle's excellent hospitality and it would be churlish if I did not beg you, Sir, to give the credit of ownership to him whose right it is and who is, even at this moment, my most kind and generous host.

Manor Farm, Dingley Dell, near Maidstone, Kent. SAMUEL PICKWICK.

1. Burwell, C. S., Robin, E. D., Whaley, R. D., Bickelmann, A. G. *Amer. J. Med.* 1956, **21**, 811.

Letters to the Editor

BANTING UP TO DATE

SIR,—Your leader of Oct. 11 and subsequent correspondence, as well as recent ephemeral booklets and misleading advertisements, may not have left your readers absolutely clear about the best way to decrease their or their patient's superfluous fat. Should they eat much fat or no fat; should they quaff Larsen's Swedish milk or sip orange-juice; should they follow the Mini-C Diet presented in *Woman* recently and based on the work of Professor Yudkin which (we are assured) " has proved that elaborate and complicated diets are unnecessary ", or eat rather more lavishly since, according to Dr. Mackarness, in an interview reported in *Woman's Own* " calories have nothing to do with obesity "? This last advice is that offered in the U.S.A. eight years ago by *Holiday Magazine*, following Dr. A. W. Pennington's reduction in weight of members of the staff of E. I. du Pont de Nemours. Perhaps we should follow Surgeon Captain Cleave's erroneous interpretation of Darwin and like our ancestors eat our neighbours uncooked.

It would be easier to follow Banting if we knew what he did and this seems to be in doubt. Mackarness follows Pennington in believing that Banting's diet was high in fat and unrestricted in calories, providing some 2800 calories daily. Your leader cautiously repeats this figure. Others have supposed his diet to have provided a mere 1100 calories daily, with 170 g. of protein, 80 g. of carbohydrate, and only 8 g. of fat; surely Banting's selection of " cold meat of any kind except pork or veal " and " any fish except salmon, herrings or eels " was intended to avoid fat. There seems also to be doubt about obesity amongst our ancestors and wild animals. Mackarness believes the former were never corpulent before the introduction of agriculture; but the earliest known statue of Man is a woman, circular, obese, pregnant, and hideous, the Venus of Willendörf now at least 30,000 years old; in those days women lived in caves eating and breeding while men chased woolly rhinoceroses and (despite Surgeon Captain Cleave's claim that exercise has nothing fundamentally to do with overweight) you are unlikely to be obese if you chase woolly rhinoceroses. Cleave believes " no wild creature is ever overweight ": weight did not help the dinosaurs to survive; and obesity, though seldom found in the tropics except amongst the hippopotamus and eland, is common in arctic animals.

Perhaps we should turn from magazines and your correspondence columns to seek the considered opinion of the profession. The British Medical Association has published a booklet entitled *Slim Safely* by John Clyde, M.D., M.A., PH.D., B.SC., who (we are told) is " one of the top nutritionists in the country " and even " one of the foremost nutritionists in the world ". It is odd that so distinguished an organisation should thus risk misleading the public who may reasonably assume that Dr. Clyde's name is to be found on *The Medical Register*. The British Medical Association may believe with Dr. Clyde that " Every healthy diet *must* contain " milk or cheese " at least twice a day " and that everyone should " Drink at least a pint of milk every day "; perhaps they will publish the evidence in due course. In assisting to launch one of the B.M.A. booklets Professor Yudkin is reported to have said that the B.M.A.'s authority could be used to assure housewives that they would not harm their husbands' health by serving fatty meals; housewives could be

encouraged to serve plenty of butter and margarine and use as much fat in their cooking as they like. This may be the view of the B.M.A. but it is not universally accepted, as I have pointed out in *The Practitioner* for October, and some would urge caution until the facts are available.

Evidence and facts, indeed, are badly needed. The short-term experiments of Professor Kekwick are very interesting, though I agree with your leader that the closest attention must be paid to changes in water metabolism. Mayer, Passmore, and others have also begun to get information so that in due course after much more research on man we may be able to bring William Banting up to date and make Billy Bunter out of date.

Oxford. H. M. SINCLAIR.

SIR,—May I deny Surgeon Captain Cleave's charge, in his letter of Nov. 8, of breaking "every evolutionary law" and of trying to force people to eat more fat than they desire?

I believe that a person's appetite for fat, unlike the appetite for concentrated carbohydrate, is finely adjusted to metabolic needs and that it is impossible to eat fat beyond your appetite for it without feeling or being sick.

It is true that when carbohydrate is severely restricted, appetite for fat increases somewhat, but no amount of sales talk will persuade a person to eat more fat than he can deal with, and I have never sought to push people's fat intake beyond this limit of tolerance.

In the penultimate paragraph of my book on obesity I say:

"Starch and sugar are the culprits. Cut them right down and eat fat and protein in the palatable proportion of one to three. You will then grow slim while you eat as much as you like and feel well because you will be eating the best kind of food."

Strangely enough, this is almost exactly what Captain Cleave says in his monograph, *Fat Consumption and Coronary Disease*, which I have reread searching for the meaning of his phrase "every evolutionary law". After giving as his first rule for proper eating (to avoid coronary thrombosis and obesity) "to eat foods in their natural state, which in the case of civilised man permits simple cooking", he says "this leads mainly to avoiding two groups of food—white flour and commercial sugar, and all products made from them".

He goes on: "The first rule, however, leads to the exclusion of very few other classes of food, all meat, poultry, fish, eggs, *fats* (his italics), vegetables, fruits, and unrefined cereals being freely allowed."

In our present state of ignorance about the significance of dietary fat in the ætiology of coronary-artery disease it is a bit dogmatic of Captain Cleave to say that I am promoting a dangerous fallacy. And the accusation would come better from him if he had not already subscribed to the same "dangerous fallacy" himself.

Richmond, Surrey. RICHARD MACKARNESS.

RHEUMATOID AGGLUTINATING FACTOR

SIR,—In your report of the recent meeting of the Heberden Society (Nov. 1, p. 943) I am credited with stating that "Rheumatoid agglutinating factor . . . had been used to immunise rabbits and produce a specific antiserum capable of neutralising the agglutinating activity". The latter part of the sentence should read "in an attempt to produce a specific anti-serum".

All anti-globulin sera which I have had the opportunity of testing have neutralised the agglutinating activity of rheumatoid serum. Tests for the presence of specific "anti-factor" antibody must therefore be more stringent.

Rheumatic Diseases Unit,
Northern General Hospital,
Edinburgh. W. R. M. ALEXANDER.

SELF-MEDICATION IN TUBERCULOSIS

SIR,—We have read with great interest your leading article of Nov. 1. Your review is a further timely reminder of the serious problems inherent in such regimes and of the great responsibilities facing physicians so managing patients.

The facts so far known are very well presented in your article but the conclusions reached in your last paragraph leave much to be desired. We feel that certain definite constructive advice can be offered based upon the facts presented: treatment should *not* depend "largely on the patient" in a condition of such potential danger to others. If we do not "know enough to make reasonably sure that patients help themselves" then we must, so far as possible, protect them from their own shortcomings.

Destruction of the *Mycobacterium tuberculosis* and the prevention of drug resistance, thus obviating relapse, are the crux of the matter. The dosage schedules advised by the Medical Research Council following their trials remain the only fully proven and acceptable means of attaining this end.[1,2] Other workers have further confirmed that such regimes, followed meticulously, do not lead to drug resistance and that when maintained for at least 18 months make relapse unlikely.[3–5] Until something better is offered or improved dosage schemes are proven, there can thus be no excuse for not following this policy.

With this in view we cannot think it reasonable to question "whether entirely regular medication in tuberculosis is necessary, provided the medicine is given in such a form that one drug cannot be taken without the other". Naturally many patients recover and remain well in spite of a high incidence of missed doses: they did so before chemotherapy was available and there is nothing to suggest that those who do not take drugs regularly are more likely to fall into the group who recover spontaneously. A combined form of dual therapy may, in theory, prevent resistance developing, but the problem of successful administration over a long period still remains. In fact a review of our own drug-resistant cases shows that resistance has developed occasionally when the only possible explanation appears to be that combined preparations (in accepted form) have been taken irregularly.

Our conclusion must thus be twofold: (*a*) continuous efficient chemotherapy must be given for at least $1^1/_2$ to 2 years; (*b*) patients left to manage their own drug administration often fail to achieve adequate regular dosage. Therapy must thus be evolved which, so far as possible, excludes the risk of patient error. In an effort to achieve this it has been our policy, for some time, to depend on streptomycin and isoniazid (6 times a week) wherever possible. Consumption of the isoniazid is ensured by giving it under supervision at the time of the injection. Complete success in administering this scheme has been attained by employing a combination of facilities. Injections may be received from nurses of the Queen's Institute at home or local nursing centre where an evening injection clinic has been provided for workers. Other patients may find it more convenient to attend the Chest Clinic or a local hospital at appropriate times. If, as we believe, such a regime should be accepted then the administrative difficulties inherent in its inception should and can be overcome.

It is inevitable that in a few cases, owing to the drug-resistance pattern, this scheme will be inapplicable. The probability of losing the use of yet another drug and of

1. Medical Research Council. *Brit. med. J.* 1952, i, 1157.
2. Medical Research Council. *ibid.* 1955, i, 435.
3. Ross, J. D., Kay, D. T. *Thorax*, 1956, **2**, 1.
4. Stewart, S. M., Turnbull, F. W. A., MacGregor, A. R. *Tubercle*, 1956, **37**, 388.
5. Ross, J. D., Horne, N. W., Grant, I. W. B., Crofton, J. W. *Brit. med. J.* 1958, i, 237.

disseminating resistant organisms is great should the patient not cooperate. It may well be wise to admit such patients for their long-term therapy. In our view dependance on "exhortations" should be exceptional rather than accepted practice.

Hammersmith Chest Clinic, London, W.12. PETER STRADLING
GRAHAM POOLE.

OCULAR LESIONS OF ONCHOCERCIASIS

SIR,—Controversy is the spice of progress and no-one will be surprised that new findings concerning ocular onchocerciasis have met with opposition. The papers referred to in the letter by Dr. d'Haussey and his colleagues (Nov. 1) will be anticipated with pleasure, and after publication there will be ample opportunity for their proper assessment. Meantime, your annotation [1] gives a very well-balanced picture of the present situation and one to which few of those who view the subject objectively will take exception.

The point which your correspondents fail to take note of and which is in urgent need of explanation is the finding that in areas in which all the inhabitants are heavily and chronically infected with onchocerciasis, ocular complications and blindness may be of the utmost rarity. Murray and I drew attention to this,[2] and Mr. Choyce's observations have now gone far towards explaining the underlying situation.

It is clear that this field of investigation has been split wide open and it may well be that this is a development from which much progress will result.

London School of Hygiene and Tropical Medicine, London, W.C.1. A. W. WOODRUFF.

SIR,—I thought your annotation [1] on this subject was very fair, and I am surprised that it has come in for criticism in the letter you published on Nov. 1. I agree that there is considerable epidemiological evidence in favour of the view that onchocercal infection is a blinding disease, but unfortunately it has not always been possible to substantiate those epidemiological claims by ophthalmological studies of onchocercal patients or by the pathological examination of excised eyes from onchocercal patients.

While no-one denies that onchocerciasis can cause blindness, a number of ophthalmologists, of whom I am one, feel that this aspect of the disease has been exaggerated. At the Hospital for Tropical Diseases in London we continue to see new cases of onchocerciasis, and cases which have relapsed following treatment. Many of these have the typical onchocercal keratitis, and I have no hesitation in assuring these patients that the risk of their going blind from this disease is negligible.

My own position would be clarified still further if you allowed me to quote the conclusions to which I came in January of this year, and which have since been published [3]:

"(1) From the ocular standpoint, onchocerciasis is essentially an anterior segment disease.

(2) In my experience at the Hospital for Tropical Diseases, and in the Cameroons, the anterior segment lesions are rarely sufficiently serious to cause blindness.

(3) One of the major posterior segment lesions, hitherto thought to be due to onchocerciasis is shown to be indistinguishable from, and possibly identical with, the condition of 'generalised choroidal sclerosis' described by Sorsby. This is a genetic disease transmitted in a dominant fashion.

(4) It is concluded that there is a need for further enquiry into the incidence and causation of blindness in onchocercal and non-onchocercal tropical communities, with special reference to genetic eye diseases, before onchocerciasis can truthfully be described as one of the great blinding diseases in the world."

Your correspondents refer to surveys in the French Sudan, and to criticisms of the symposium on onchocerciasis held by the Royal Society of Tropical Medicine and Hygiene, both awaiting publication. When they appear in print I shall, of course, examine them very carefully, but, in the meantime, my views continue to be as stated above.

London, W.1. D. P. CHOYCE.

1. *Lancet*, 1958, i, 1165.
2. *Proc. Congr. Ophthal. Soc.* 1957, **77**, 285.
3. Choyce, D. P. *Trans. R. Soc. trop. Med. Hyg.* 1958, **52**, 95.

THE CARDIORESPIRATORY SYNDROME OF EXTREME OBESITY

SIR,—In your issue of Nov. 1 Dr. Berlyne describes a case of this syndrome. In this condition the use of human chorionic gonadotrophin, combined with a diet of 500 calories,[1] yields particularly satisfactory results as shown in the following case.

A married retired pharmacist, aged 68, was admitted to hospital on June 23, 1958. Until he was 30 his weight had been normal and he had led a very active life. Since then he had gradually put on weight, though during the last 6 months the increase had been particularly rapid (20 lb.). He had undergone many "cures", but had never obtained satisfactory results. He was a heavy eater, but had never drunk more than one glass of wine with each meal.

His height was 5 ft. 7 in. and he weighed 28 st. 6 lb. (like Dr. Berlyne's patient he had to be weighed on the large scale used for hospital stores). He was only just able to support his own weight standing up and could move only a few small steps at a time when supported on both sides. He had been bedridden for several weeks. His face was purple, his eyes bloodshot and bulging. He was so dyspnœic that even when at rest he was only able to speak a few words at a time.

He was bedded on two mattresses strapped side by side on the floor, as it was impossible to get him into a hospital bed. The red-cell count was 6·4 million per c.mm. Blood-cholesterol was 148, blood-urea 30, and blood-sugar 170 mg. per 100 ml., and the urine was normal. The resting pulse-rate was 85 and the blood-pressure 145/70 mm. Hg. The E.C.G. was within normal limits. Lying flat on the right side was more comfortable for him than sitting up. The patient was extremely somnolent and the fact that his "brain no longer worked" had been the chief inducement for seeking medical help, as he had long since despaired of losing weight. There was no twitching.

Intermittent oxygen and a diuretic (acetazolamide) were given for the first three days, though the diuretic response was satisfactory only on the first day (2300 ml.). Beginning on the day of admission, 125 I.U. of human chorionic gonadotrophin was injected daily. The patient was allowed to eat his fill of a high-protein and low-salt diet for the first 48 hours and then, after the third injection, put on 500 calories without any restriction on salt or fluid intake. No vitamins were given.

Seven days later the patient was able to walk alone, using only a stick. His blood-sugar had dropped to 118 mg. per 100 ml., and there was no cyanosis and no breathlessness at rest. He was euphoric and spent much of his day writing verses. His weight had dropped to 27 st. Ten days after admission he was instructed how to prepare his diet at home and transferred to the outpatient department, which he attended daily. On Aug. 2 after 40 injections his weight was 25 st. 4 lb. He was now able to walk freely and had discarded his stick. Treatment was stopped and for the next 6 weeks he was allowed to eat what he pleased, but was told to weigh every day and to skip one meal on any day on which his weight increased more than 2 lb. over the weight reached at the end of the treatment. He found it necessary to skip a meal only on one occasion, and when he returned for the second course of chorionic gonadotrophin and diet he had lost another 6 lb. During the next 6 weeks treatment was given daily. This brought the weight down to 23 st. 6 lb. The red-cell count

1. Simeons, A. T. W. *Lancet*, 1954, ii 946.

was now 4·9 million. During treatment the patient had again led a normally active life; he moved about the city alone and had started using buses.

Having to date lost a total of 5 st. with only 12 weeks of active treatment, he is now in his second 6 weeks' interval on a free diet. That he is not regaining weight confirms our experience that when human chorionic gonadotrophin in small daily doses is added to a severe reducing diet, the patient feels no hunger and does not easily regain weight when returned to a normal diet.

I entirely agree with Dr. Berlyne's interpretation of the cardiorespiratory syndrome occurring in extremely obese patients as alveolar hypoventilation due to the mechanisms listed in his interesting article.

Salvator Mundi International Hospital, Rome. A. T. W. SIMEONS.

A CORONARY PARADOX

SIR,—Your annotation of Nov. 1 refers to the work of Pomerance [1] in demonstrating increased numbers of mast cells in the arteries of cases of coronary thrombosis, and to the work of Sundberg [2] who had previously shown a similar state in the veins of patients with venous thrombosis. This is stated to be the precise reverse of the expected results in these investigations, assuming heparin plays a major part in the mechanics of thrombosis.

There are reasonable grounds for the belief that heparin deficiency, or impaired heparin activity, may have an important relationship to intravascular clotting. Several workers [3–6] have demonstrated increased resistance to the anticoagulant action of heparin in large numbers of patients with recent thromboembolic disease.

The reduced sensitivity to heparin in these disorders has not previously been adequately explained. A simple explanation is now possible. It has been shown that there is a significantly increased plasma factor-VII activity in cases of thrombosis within 48 hours of the onset of these disorders [7]. A further report [8] shows that serum which is rich in factor-VII activity and factor-VII extracts prepared by adsorption and elution of serum possess remarkable antagonistic action to the anticoagulant effect of heparin. Resistance to heparin in thromboembolic disease seems likely therefore to result directly from increased factor-VII activity.

The relationship to the initiation of clot formation is not well established. Work by Wessler [9 10] who produced rapid intravascular thrombus formation by the infusion of factor VII (S.P.C.A.)-rich solutions, suggests there may be a direct causal role played by factor VII. The effect may, however, be an indirect one resulting from the release of serum products into the circulation.

The results of Pomerance and Sundberg may also be explained on the same basis. Increased mast-cell production may be a direct physiological response to the raised circulating factor-VII level which has neutralised natural heparin. The demonstration by Pomerance that the greatest number of mast cells were in the segments of arteries which were the sites of fresh thrombi, may be taken as further evidence in support of this hypothesis for at these very points in the vascular channels the level of factor-VII activity released from local clot formation may be expected to be greatest.

Department of Clinical Pathology, Manchester Royal Infirmary, Manchester. L. POLLER.

1. Pomerance, A. *J. Path. Bact.* 1958, **76**, 55.
2. Sundberg, M. *Acta path. microbiol. scand.* 1955, suppl. no. 107.
3. Ogura, J. *J. clin. Invest.* 1946, **25**, 48.
4. de Takats, G., Marshall, M. M. *Surgery*, 1952, **31**, 13.
5. Rosenthal, R. L., Weaver, J. C. *Circulation*, 1956, **15**, 55.
6. Poller, L. *Clin. Sci.* 1956, **15**, 55.
7. Poller, L. *J. clin. Path.* 1957, **10**, 348.
8. Poller, L. *ibid.* (to be published).
9. Wessler, S. *J. clin. Invest.* 1954, **33**, 977.
10. Wessler, S. *ibid.* 1955, **34**, 647.

EXERCISE-TOLERANCE TESTS

SIR,—Dr. Master (Nov. 8) has raised the question of exercise tests based on electrocardiographic changes. His contributions in this field are, of course, well known. I omitted reference to this type of test from my article (Aug. 23) because, as at present used, it is primarily a qualitative diagnostic test for ischæmic heart-disease, not a quantitative test which measures a patient's working capacity.

I feel sure that Dr. Master does not object to my giving his original heart-rate test priority in the section devoted to heart-rate tests, although I readily agree that despite the claims made for it in 1929 and 1935 it is now mainly of historical interest.

Department of Medicine, University of Edinburgh. E. A. HARRIS.

GASTROINTESTINAL HÆMORRHAGE AND SALICYLATES

SIR,—The reports by Dr. Summerskill and Dr. Alvarez (Nov. 1) on the occurrence of gastrointestinal hæmorrhage during the administration of salicylates seem to explain many of the puzzling symptoms which develop after coryza, catarrhal fever, or influenza treated with salicylates. Dr. Summerskill and Dr. Alvarez are concerned with the objective sign of occult blood in the stools, and any symptoms of the chemical gastritis would be obscured by the more arresting pains due to the peptic ulcers found in some 50% of these patients.

For the past year I have been studying the syndrome created by large and repeated doses of salicylates given to "ward off" colds, febrile catarrhs, and influenza and comparing this syndrome with the natural diseases.

Unfortunately, it is difficult to find examples of natural disease and cure because (*a*) such people do not consult a doctor, and (*b*) many people try to keep going or avoid troubling the doctor by consuming generous amounts of the tablets and powders advertised and recommended for such conditions. During this period I have observed symptoms of œsophagitis and gastritis following the administration of aspirin compounds, soluble and insoluble, acid or buffered, to patients with coryza, catarrhal fever, and influenza. These are:

(1) Vomiting, mostly in children.
(2) Retching of mucus and sour fluid.
(3) Accumulation of tenacious mucus in the pharynx overnight.
(4) A dry racking cough accompanied by raw, itching, or burning sensations in the centre of the chest. The cough is often in spasms and ends in vomiting.
(5) Bruise-like pains or discomfort in the epigastrium or around the costal margins emphasised by coughing.
(6) The upper respiratory signs of coryza consisting of sneezing and rhinorrhœa are replaced by complete nasal obstruction and neuralgic pains from congested sinuses.

The natural history of these simple virus infections can be reproduced by stopping the aspirin administration in an infection which is not more than about five days old. The patient is put to bed on a very light diet or even a fruit fast. Within twelve hours a fever occurs accompanied by general malaise and headache which lasts from twelve to forty-eight hours. Subsequently there is a sore pharynx and later still nasal obstruction; each phase lasts a day or two and causes little distress or disturbance. Not one of the symptoms listed above appears.

I believe that the states of disease under discussion are defensive reactions of the body when invaded or threatened by viruses, and are therefore beneficial. Aspirin compounds have a cortisone-type action and will check and disrupt this beneficial fever and malaise. When this occurs, what happens to the virus which was probably swarming in the blood during the febrile period so rudely upset by aspirin? It is no longer on the endothelial membrane of the upper respiratory tract

with a general defensive reaction imposed between the host and the virus. I suggest that the virus is invisibly incorporated into the biochemical structures of the reticulo-endothelial systems in the liver, spleen, bone-marrow, and lymph-glands, ready for metamorphosis into live virus again when the environment becomes inimical.

It is not appropriate here to outline all the possible complications and sequelæ which could ensue if aspirin compounds are antagonising Nature's attempts to resolve these illnesses. Nor am I qualified to produce monumental treatises for the guidance of posterity. But any general practitioner can find out for himself how short, simple, and safe is the course of one of these infections when managed by bed rest, common sense, and common salt.

Navestock, near Brentwood, Essex. P. D. MULKERN.

ORAL TREATMENT OF PERNICIOUS ANÆMIA

SIR,—The correspondence on oral vitamin-B_{12} therapy of pernicious anæmia in your recent issues has been followed by us with interest as we have, in the press, a report of an extension of previous studies.[1] This now includes serum-vitamin-B_{12} estimations in long-term observations of patients with pernicious anæmia receiving no other therapy than oral crystalline vitamin B_{12} taken daily.

Dr. Mooney and Dr. Heathcote (Nov. 8) state that Chalmers and Hall [1] *attributed* the results they obtained with oral vitamin B_{12} alone "to strict precautions taken to ensure that the patients took the dose when fasting . . .". This is not entirely correct. It was then considered that our results "*could* be related" to such precautions. However, experience over the past five years has shown that orally administered vitamin B_{12} can be effective independent of the fasting state and this is also the opinion of Estren and Wasserman,[2] in a paper which Dr. Mooney and Dr. Heathcote quote in another context.

To summarise our own results, 27 cases of pernicious anæmia have now been treated with oral vitamin B_{12} alone in doses ranging from 20 to 500 μg. daily. All but 3 showed hæmatological improvement within fifteen days. 12 of these cases were maintained on a standard dose of 50–500 μg. vitamin B_{12} daily for periods of six to fifty months. They remained in good health during this period of supervision and only 1, who was receiving a daily dose of 50 μg., showed a slight fall in hæmoglobin and red-cell count in the forty-fifth month of treatment. While effect may be observed with doses of 50 μg. daily or even less, higher dosage of 100 μg. or more daily appears necessary to maintain serum-vitamin-B_{12} values within normal range.

When our results are published in detail it is possible that Dr. Heathcote and Dr. Mooney may withdraw their statement in their review article [3] that "in contrast to crude liver preparations, the crystalline vitamin is ineffective, even in large doses, in the oral therapy of pernicious anæmia" even though they subsequently mention evidence to the contrary.

While in our long-term studies we have used higher dosage of oral vitamin B_{12} than Heathcote and Mooney [4] have employed with their vitamin-B_{12}/peptide complex, we feel, like other correspondents,[5–8] that control studies using equivalent amounts of oral vitamin B_{12} itself would have been desirable when developing their new approach to the subject and that such would not necessarily have been, as they say in their letter, "superfluous" nor even "strictly speaking, quite impossible".

The Queen Elizabeth Hospital, Birmingham. J. N. MARSHALL CHALMERS
N. K. SHINTON.

1. Chalmers, J. N. M., Hall, Z. M. *Brit. med. J.* 1954, i, 1179.
2. Estren, S., Wasserman, L. R. *Proc. Soc. exp. Biol., N.Y.* 1956, **91**, 499.
3. Heathcote, J. G., Mooney, F. S. *J. Pharm. Lond.* 1958, **10**, 593.
4. Heathcote, J. G., Mooney, F. S. *Lancet*, 1958, i, 982.
5. Green, C., Latner, A. L. *ibid.* 1958, ii, 156.
6. Castle, W. B. *ibid.* p. 270.
7. Glass, G. B. J. *ibid.* p. 747.
8. Herbert, V., Estren, S., Brody, E., Wasserman, L. R. *ibid.* p. 801.

INTRA-ARTICULAR THERAPY IN RHEUMATOID ARTHRITIS

SIR,—Dr. Loxton, in his letter of Nov. 1, makes some criticisms of our statistical methods which are in part unbalanced and, at worst, absurd.

There is no reason why 't' should not be plotted against time, a device which gains much in efficiency of presentation. If by "odd" Dr. Loxton means "unfamiliar" he should say so. Is there any valid reason why 't' should not be calculated from arbitrary categories (in the case of pain and tenderness)? Provided these are clearly defined they serve equally with other measurements as efficient units of comparison between groups.

"Probably significant improvement lasted eight weeks." We agree that this could have been phrased more happily, but when P borders on significance verbal description cannot place the precision of the actual figures obtained. These are clearly shown in the accompanying chart.

It was, and remains, our opinion that larger numbers of patients in the trial might have shown a more definite benefit that would uphold the claim for the greater effectiveness of hydrocortisone T.B.A. We think it unlikely, and within the reasonable requirements of adequate clinical material established to our satisfaction, that there was no significant difference between the two compounds tested. If Dr. Loxton disagrees, that is his opinion; but it seems to be founded entirely on quibbles.

Leeds. G. N. CHANDLER.

THE RUSSIAN VACCINE

SIR,—In view of the letters by Dr. Liversedge (June 7) and Dr. McCluskie and Dr. Timbury (June 28) we should like to describe our experience of the Margulis-Shubladze vaccine.

We have treated 80 patients (33 men and 47 women) with an unequivocal diagnosis of disseminated (multiple) sclerosis. 55 have been followed up for at least twenty-one months, and the remainder for thirty-three months. In 31 cases the treatment was repeated up to six times. The vaccine was given by the intradermal route to 52 patients, and subcutaneously to 28. In all cases a full clinical history was taken, and a complete neurological assessment was made before, during, and after treatment.

After the first course of treatment there was a definite improvement in 9 (11·25%), slight improvement in 28 (35%), deterioration in 4 (5%), and no change in 39 (48·75%). Of 18 paraplegic patients only 4 were able to walk a little as a result of treatment, whereas 12 of 37 patients who were less disabled before were able to resume their work after treatment.

Eighteen to thirty months later there was a definite improvement in 6 (7·5%), slight improvement in 16 (20%), deterioration in 30 (37·5%), and no change in 28 (35%). Thus the vaccine had a lasting effect in only about a quarter of the patients treated.

Early cases or chronic cases with remissions seemed to respond most readily. Anatomically the best results were seen in cerebrospinal forms of the disease, and there was little effect on retrobulbar neuritis or on the purely spinal forms. Sometimes there was improvement when previous treatment had been ineffective, but this is also seen, though perhaps less often, with other methods. We do not think the vaccine ever causes deterioration, but it is often unable to prevent the relapses and the progression of the disease. We therefore consider the vaccine is a useful but non-specific method, which seems to act as a mild form of shock treatment.

Neurological Department, Charles University, Prague, Czechoslovakia. K. HENNER
L. POLÁČEK
V. VLACH.

ANABOLIC STEROIDS

SIR,—Your leading article of Oct. 25 might convey the impression that the cost of one week's treatment with 'Durabolin' is also as high as £3 to £5. The weekly dose of durabolin required to produce the same order of nitrogen retention that results from the daily oral dosage of ethyl-19-nortestosterone costs from 7*s*. to 14*s*. The depot injection of only 25–50 mg. no more than once a week carries too little androgenic potency for appreciable virilisation to occur, and durabolin has no progestational effects.

Organon Laboratories Ltd., London, W.C.2. — W. J. TINDALL, Medical Director.

SIR,—Whilst we were very interested to read your leading article on anabolic steroids in your issue of Oct. 25, we were perturbed to note the concluding reference to the cost of weekly treatment with 'Nilevar' (norethandrolone) in hospitals and your statement that this may amount to £4 or more for one patient. In actual fact the appropriate cost is approximately half the figure stated, as based on prices in the Hospital Price List and calculated on our recommended dosage of 30 mg. daily.

You will appreciate that statements of this kind can be very misleading, and in the circumstances we suggest for the future that confirmation is sought from a reliable source. We would add that such information is always available and that we should be happy to provide it.

G. D. Searle & Co. Ltd., High Wycombe, Bucks. — H. A. R. GOUGH, General Sales Manager.

*** Messrs. Searle apparently base their estimate of the cost of treating a patient for one week with 'Nilevar' on the use of the lowest recommended dose and the most economical size of pack. In their literature they suggest a total daily dose of 30–50 mg. If 50 mg. is given and the tablets are dispensed from a bottle of 50 tablets (the intermediate size of pack) the cost of a week's treatment in hospital would be 76*s*. 5*d*.; if doses in excess of 50 mg. are used, as they were in both the investigations recorded in our issue of Oct. 25, our estimate of £4 would readily be exceeded.—ED. L.

DISSEMINATION OF MICRO-ORGANISMS BY A SURGICAL PUMP

SIR,—Mr. Ranger and Dr. O'Grady have recently described how a surgical suction pump disseminated staphylococci into the air of a ward.[1] They prevented this by fitting a cotton-wool filter to the exhaust outlet of the pump. A few years ago we made a similar observation in an operating-theatre and overcame the problem by conveying the exhaust from the pump, through rubber tubing and a brass pipe in the window-frame, to the outside air.[2] Both of these safety measures are satisfactory. A filter is, perhaps, more suitable for use in a ward. In the theatre we prefer the method we have described because the surgeon can easily check that it has been done before he uses a sucking machine. He would not be able to see, at a glance, if a fresh filter had been inserted.

Unfortunately, many commercial sucker units used in operation theatres have their exhaust outlets so placed that considerable modification is needed before tubing or a filter can be attached. In one popular type the outlet is deeply recessed and discharges on to the floor under the machine. We suggest that makers of these items of surgical equipment should redesign them so that a filter or rubber tubing can be more easily connected. Surgeons should refuse to use a sucking unit unless it is so adapted and should make sure that the necessary precautions have been taken before they aspirate contaminated fluids in the ward or in the theatre.

Public Health Laboratory, General Hospital, Middlesbrough. — R. BLOWERS, K. R. WALLACE.

1. Ranger, I., O'Grady, F. *Lancet*, Aug. 9, 1958, p. 299.
2. Blowers, R., Mason, G. A., Wallace, K. R., Walton, M. *ibid.* 1955, ii, 786.

PLATELET AGGLUTINATING FACTOR IN GLANDULAR FEVER COMPLICATED BY JAUNDICE AND THROMBOCYTOPENIA

SIR,—We should like to bring to your notice our inadvertent omission of the name of Dr. S. S. Epstein, our coauthor, from the heading of our article on this subject in your issue of Oct. 25.

St. Mary's Hospital, London, W.2. — TRISTRAM FREEMAN.
The National Hospital, Queen Square, London, W.C.1. — G. S. WAKEFIELD.

MUSEUM OF SURGICAL ANTIQUITIES

Dr. J. F. BRAILSFORD, secretary in the British Isles for the International College of Surgeons, writes:

"In the Hall of Fame of the International College of Surgeons in Chicago, a museum of surgical antiquities is being built up. Other countries of the world have contributed magnificent collections of old instruments, paintings, &c. I should like to appeal to all medical men who have any example of old instruments, &c., for this museum. Suitable acknowledgment will be made on all articles contributed. At present we have little to represent this country which has subscribed so much to the development of medicine."

Dr. Brailsford's address is 20, Highfield Road, Edgbaston, Birmingham, 15.

Medicine and the Law

Medical Certificates for National Insurance

THE form of medical certificate prescribed for issue in connection with National Insurance claims involves an express statement that there has been an examination of the patient on the date in question. According to a recent ruling of the Scottish courts, this means that the patient has been seen on that date and his condition investigated so far as the physical circumstances permit that to be done.

The case arose out of a charge against a practitioner that he had knowingly made a false statement and a false representation that on Dec. 9, 1957, he had examined George Black and that by reason of a foot operation he was incapable of work up to and including that date. There was an identical charge with regard to the issue of a further certificate on Dec. 16, 1957.

The case was tried in the local Sheriff Court. It appeared that the practitioner had referred Black to the Royal Infirmary, Glasgow, in respect of a disability in his right foot. The patient was examined by Mr. Archibald Macdougall, who found that a stabilising operation would be necessary involving a triple arthrodesis. This operation was carried out on June 21, 1957, and Mr. Macdougall reported to the practitioner accordingly. It was known to both the surgeon and the practitioner that the inevitable result of such an operation was that Black would be totally incapacitated for work for at least six to nine months; in fact he was continuously incapacitated during a

period of ten months. The patient continued for the purposes of treatment to be under the care of Mr. Macdougall until he was finally discharged as fit for work on April 14, 1958.

On Dec. 9, 1957, Black's wife called on the practitioner and asked him to treat her small child for some minor ailment, which he did. The child having been prescribed for, Mrs. Black asked the doctor if he would give her her husband's usual medical certificate, explaining that his leg had become swollen and that he had stayed in bed as a result. The doctor said that he was not accustomed to issuing a certificate without seeing the patient but that he would make an exception on this occasion. On Dec. 16 Mrs. Black again called with the child and again asked for her husband's usual medical certificate, saying that the leg was still painful and that he felt it advisable to stay in the house; the doctor told her that Black must come and see him during the week, but he gave her the certificate. On both occasions, the story told by the wife was untrue because Black was in prison serving a short sentence.

The Sheriff found that the practitioner had not interviewed the patient on either occasion and had examined him only in the sense that he had considered his case and reminded himself of his medical condition and had satisfied himself as to his continued incapacity for work. The doctor was entitled to assume that Black's incapacity for work continued until the surgeon informed him of his discharge; further, it would have been improper for him to remove the plaster and bandages applied by the surgeon.

The Sheriff acquitted the practitioner of the charges. The main grounds of his decision were: (1) that the word "examine" is capable of meaning not only to investigate by visual inspection or manipulation (a course which was not open to the doctor) but also to inquire into or investigate generally; (2) that the doctor was entitled, in the light of his knowledge of the case, and with a due sense of professional responsibility, to decide which kind of examination was necessary; (3) that the circumstances were such that nothing could have been added to the doctor's knowledge of the case by a personal interview, and that he was entitled to use the word "examine" in its wider sense.

The Crown asked the Sheriff to state a case for the opinion of the High Court as to whether he was entitled to hold the doctor not guilty on the facts. All three judges who heard the case were of opinion that a certificate that a patient has been examined on a certain date can only mean that the patient has been seen and his condition investigated so far as the physical circumstances permit this to be done. The Lord Justice General pointed out that, where a doctor issues a statutory certificate of this kind which authorises or may authorise the expenditure of public money, laxity is to be deplored and strict compliance with the regulations is necessary if the door is not to be opened to persons securing national insurance benefit to which they are not entitled: it was no doubt partly in view of that consideration that the form of the certificate required an examination of the patient on the date in question as well as a diagnosis of capacity.

Two of the judges therefore considered that there was no alternative to holding the doctor guilty of the charges brought against him. The third judge, although agreeing with the others on the meaning of the word "examine", thought the practitioner could not be held guilty of the charges in view of the way in which they had been framed. They alleged not only a false statement about the examination but also a false representation about the man's condition. But it was clearly proved that there was no misrepresentation about the man's condition; what the doctor certified on that point was literally accurate and true, and he had good reasons for knowing it to be so. It was unnecessary, however, to pursue this matter further because the Crown were not asking for a conviction but simply for a ruling as to what was meant by the word "examination".

There can be little doubt that their Lordships' views as to the meaning of the word in this context were correct. One can no doubt examine a question or even a patient's condition in the sense mentioned by the Sheriff, but surely one can examine a patient only by actually seeing him. No doubt the doctor behaved quite reasonably in the circumstances, but he could not be said to have complied with the requirement that the patient must be examined.

Death of an Infant

AT a Bedford inquest on Nov. 4,[1] the coroner heard evidence by a pathologist that a three-month-old infant had died of sagittal-sinus thrombosis. Another pathologist, who had earlier said that he believed death to be due to brain damage caused by head injuries, stated that he now accepted the first pathologist's findings. This pathologist said that he found bruises on the child's head and face consistent with marks caused by fingers, either by hard pressure or by striking.

In July at Birmingham the infant's mother was acquitted of murdering the infant and was discharged. At the inquest the coroner said he had enough evidence to complete his certificate. The inquest would be adjourned and would not be further resumed.

Parliament

QUESTION TIME

Atomic Radiation Effects

Mr. JOHN RANKIN asked the Prime Minister to what extent he had studied the report of the scientific committee of the General Assembly of the United Nations on the dangers of radiation; if he had noted their warning that even a slow rise in environmental radioactivity can cause appreciable damage to populations.—Mr. HAROLD MACMILLAN replied: I have given careful study to the report and also to the statement on the report by the Medical Research Council. In their consideration of all questions relating to the effects of radiation, the Government will take the conclusions of the report into account.

Mr. RANKIN: Does the Prime Minister realise that now we have this report pointing out the dangers of atomic radiation and the special committee of the Medical Research Council has expressed general agreement with its findings? Is he not prepared to say that it is not merely his hope but also his view—and that of the Government—that nuclear tests should be stopped for ever?—Mr. MACMILLAN: The report made clear that the radiation dose to be expected from the fallout of tests was minute compared with other causes both natural and man-made. Some of these natural causes are due to the geological formation and radioactivity of rocks, and so forth, which are matters for further study. The man-made causes include luminous watches, clocks, television receivers, and the shoe-fitting fluoroscope. Regarding the latter, action has been taken by the Home Secretary. Concerning the question of diagnostic radiology, a committee, under the chairmanship of Lord Adrian, is inquiring into this matter, and that, perhaps, is one of the most important aspects of it. There is also the question of occupational exposure among certain industrial, medical, and atomic-energy research-workers. There very careful and minute medical procedure is carried out, but if it is necessary to tighten up that procedure we shall examine that matter, too.—Mr. RANKIN: Admitting all that the Prime Minister has said, in view of the dangers that arise from these causes, is it wise that we should add to them by political decisions?—Mr.

1. *Manchester Guardian*, Nov. 5, 1958.

MACMILLAN: No, Sir, but it is right that we should look at the matter as a whole.

Mr. P. J. NOEL-BAKER: Has the Prime Minister observed that last week the new chairman of the United States Atomic Energy Commission admitted that the number of test explosions made last year by the United States was 32 and not 16, as had been previously declared? Does this mean that the studies made by the United Nations Committee and the Medical Research Council were based on incomplete information about the amount of radiation released by tests?—Mr. MACMILLAN: No, Sir, but I think it is generally agreed that, apart from the radiation side of the question, there are other aspects. From natural and other man-made causes there are far greater dangers than from the tests. Of course, I hope that we shall reach agreement on abolishing the tests, but I think that the matter should be held in proportion.

Milk Teeth

Mr. F. J. WILLEY asked the Minister of Health, as representing the Lord President of the Council, what steps were being taken to cooperate on an international milk-teeth radiation census.—Mr. DEREK WALKER-SMITH replied: Should an international milk-teeth radiation census be initiated, the appropriate bodies in the United Kingdom would gladly cooperate, but I understand that there are many technical difficulties to be overcome first.

Royal Commission on Remuneration

Mrs. LENA JEGER asked the Minister of Health when he expected to receive the report of the Royal Commission on doctors' pay.—Mr. DEREK WALKER-SMITH replied: The Commission is still taking evidence and collecting necessary information. It expects to be able to submit its report about next summer.

Waiting List of Chronic Sick

At the end of 1957, nearly 10,700 names were on waiting-lists for 57,600 chronic sick and geriatric beds in National Health Service hospitals in England and Wales.

Public Health

Typhoid Fever and Oysters

BACTERIOLOGICAL investigations have shown that some recent cases of typhoid fever in the London area and in Suffolk have been due to a type of organism similar to one previously isolated from persons associated directly or indirectly with West Mersea in Essex. 3 of the patients are known to have eaten oysters derived from the West Mersea beds. The medical officers of health of the Maldon Port Health Authority and West Mersea Urban District, in consultation with the scientific officers of the Ministry of Agriculture, Fisheries and Food at Burnham-on-Crouch, are taking action to prevent further infection from the suspected source.

Appointments

BALL, E. M. P., M.R.C.S.: assistant pathologist, Nottingham General Hospital.
DISCOMBE, CYNTHIA J., M.D. Lpool: consultant pathologist, Ormskirk and district H.M.C. group.
PLEWS, W. B., L.R.C.P.E., D.OBST., D.P.H.: M.O.H. and divisional M.O., Macclesfield and Bollington.
POND, D. A., M.D. Cantab., M.R.C.P., D.P.M.: part-time consultant physician, Bethlem Royal Hospital and the Maudsley Hospital, London.
TYSER, P. A., M.D. Lond., D.P.H.: M.O.H., Cambridgeshire.
YOUNG, W. B., M.B.E., B.M. Oxon, F.R.C.S.E., F.F.R., D.T.M., D.M.R.: part-time director of diagnostic radiology, Royal Free Hospital, London.

The Hospital for Sick Children, Great Ormond Street, London

BERWICK, E. P., M.B. Belf.: anæsthetist, Tadworth Court Hospital, Surrey.
EASTWOOD, ROSALIE E. B., M.D. Glasg.: house-physician.
RATNER, VICTOR, M.B. Lond.: officer to neurological and neurosurgical department.

Obituary

JOHN HAMMOND PALMER

M.D. McGill, F.R.C.P., F.R.C.P.(C.), F.A.C.P.

Dr. Palmer, a distinguished Canadian physician and cardiologist, died on Aug. 9 at the age of 62 in Montreal, where he was associate professor at McGill University, and physician in charge of the department of cardiology of the Royal Victoria Hospital.

He began his medical studies at McGill University in 1913, leaving in the 1914–18 war to serve overseas, first with a Canadian field ambulance and later with the R.C.N.V.R. After that war he returned to McGill and graduated in 1921. He visited Europe again in 1930 and 1931 when he did post-graduate work in Vienna and London, and from 1934 to 1936 he worked in the cardiac department of the London Hospital. During the late war he served with No. 14 Canadian General Hospital and in 1944 acted as consultant to the Canadian corps in Italy. Early in 1945 he became chief consultant in medicine to the Canadian Army, with headquarters in London and the rank of brigadier. He was elected F.R.C.P. in 1942, and he was a corresponding member of the British Cardiac Society. In 1954 he became assistant secretary general of the International Society of Cardiology.

J. P. writes:

"Dr. Palmer was not only a sound consulting physician, but he was successful in teaching and apt for research. Among other subjects he wrote on the prognosis of, and the blood-pressure following, coronary thrombosis, and on heart block.

"He was a man of character, a natural gentleman who won and kept the respect and affection of his colleagues and his many friends in Canada, the United States, and Britain. He had an attractive personality and though at times tenacious of his ideas he was always courteous and willing to be convinced. To his patients he was invariably kind and helpful. He was fortunate in having the constant support of a charming wife and three lively daughters."

IVOR CHANCE

M.B. Lond.

Dr. Chance, who had lately returned from three years' work in a mission hospital in Uganda, to practise in Reading, died on Oct. 27.

He studied medicine at the Middlesex Hospital, London, and after qualifying in 1948 he held house-appointments there and at the Ashford Hospital, Middlesex. In 1955 he gave up his plans to settle in practice in this country in order to work for a time at Mengo Hospital, Kampala.

Of his work in Africa W. R. B. writes:

"Chance threw himself with characteristic energy into all the varied activities of medical missionary work. Pædiatrics was his great interest, and he spent much time devising plans for the new children's ward, in which the mothers are given their own dormitory and courtyard. He enlisted the help of Church World Service of America in dealing with the problem of kwashiorkor, and, in cooperation with the Y.W.C.A., arranged for many tons of dried milk powder to be distributed to the under-five-year-olds in central Uganda. He did a great deal to help the Sanyu Home in Kampala for motherless babies, working hard to improve the facilities and the diets for these children. At the time of his death he was seeking fresh support for it in England, and had plans for an extension of cottage homes and foster-parents for the many orphan children in Uganda. Although he was only in Uganda for three years, he made a lasting impression not only by his professional keenness but by his warmhearted friendliness and generosity, his transparent sincerity, and his true Christian witness. He is remembered with gratitude and affection by many hundreds of his friends of all races, who think of him as a real friend and brother as well as a beloved doctor."

Dr. Chance is survived by his widow and four children.

Notes and News

A COLLEGE CONFERENCE

As the subject of their second conference, the Royal College of Physicians of London have chosen Clinical Effects of Electrolyte Disturbances. Prof. Robert Platt, P.R.C.P., will open the conference on Friday, Feb. 27, and it will continue on Saturday, Feb. 28.

The speakers will include: Dr. D. A. K. Black, Dr. Victor Wynn, Dr. D. S. Munro, Prof. C. E. Dent, Prof. G. M. Bull, Dr. A. G. Spencer, Dr. R. I. S. Bayliss, Prof. M. L. Rosenheim, Dr. K. G. Lowe, Dr. L. P. R. Fourman, Dr. Brian McArdle, Prof. F. T. G. Prunty, Dr. M. D. Milne, Dr. E. J. Ross, Dr. J. D. N. Nabarro, Dr. H. E. de Wardener, Dr. Oscar Brenner, and Prof. G. M. Wilson.

The conference is primarily arranged for fellows and members of the college who are consultants in medicine or pathology. Numbers may have to be limited, and application should be made to the registrar, at the college, Pall Mall East, S.W.1, not later than Jan. 23. The entrance fee of five guineas includes lunch on both days and dinner on Feb. 27.

CENTRAL MIDWIVES BOARD AT HOME

NOBODY could say that the new headquarters of the Central Midwives Board lacks character. The board have taken over the home built for himself in 1883 by W. S. Gilbert, and now called Iolanthe House: and they have adapted it to their needs without spoiling what is not only a fascinating period piece but also an attractive building splendidly embellished.

Here, after five months' occupancy, the board gave a housewarming party on Nov. 6. Mr. Arnold Walker, as chairman, explained that, in rent, the new headquarters, in their glory, are far less expensive than the old ones, in their squalor. Mr. Derek Walker-Smith, the Minister of Health, deprecated the word squalor: the official brief, he said, described the old premises as "more or less unsatisfactory". The house bore the stamp of Gilbert, who had taken the view that in all the woes that curse our race there is a lady in the case—but he had not been speaking of midwives. Nowadays midwives attended nearly 98% of domiciliary births—in 80% of cases without what the Minister (recollecting himself) described as the help and assistance of a doctor. Whereas there was a great deal to be said for midwives, nothing whatever could be said against them except that there were not enough. He paid a tribute to Mr. Walker's service as a member of the board for 22 years and its chairman for 12—the latest of a distinguished line beginning with Sir Francis Champneys. He hoped that Iolanthe House would serve the board well in the 64 years for which it has been leased. Its address is 39, Harrington Gardens, South Kensington, London, S.W.7.

University of Oxford

On Nov. 1 the following degrees were conferred:

D.M.—G. É. Rousseaux, *E. D. Acheson.
B.M.—*Eileen M. R. Ghey.

* In absentia.

University of Cambridge

On Nov. 1 the degree of M.B. was conferred on J. C. Rice.

University of Birmingham

The title of reader in comparative neurology has been conferred on Mr. J. T. Eayrs, D.SC.

University of Aberdeen

On Nov. 5 the degree of M.D. was conferred with honours on H. G. Richmond, and with commendation on R. S. Crow.

Promotion of Health in Middle Age

The Central Council for Health Education will hold a seminar for medical officers on this subject at the Ivanhoe Hotel, Bloomsbury Street, London, W.C.1, from Feb. 24 to 27.

The speakers will include Dr. Josephine Barnes, Dr. Doris Odlum, Dr. W. S. Parker, Dr. R. J. F. H. Pinsent, Dr. Robert Piper, Dr. John Fry, Dr. Kenneth Hazell, and Dr. David Morris. Further particulars may be had from the Medical Director of the Council, Tavistock House North, W.C.1.

Royal College of Physicians of Edinburgh

At a meeting of college held on Nov. 4, with Dr. A. Rae Gilchrist, the president, in the chair, the following were elected to the fellowship:

F. P. Reid, E. Maung, Kedar Nath Gour, Robert Schneider, Tobias Schneider, Inder Singh, Nawab Ali, Isidore Schrire, H. A. Reid, J. M. Staveley, G. B. Tait, Malcolm Watt, S. G. Nelson, G. M. Carstairs, J. N. Swanson, D. H. Clark, Marjory A. Keith, Amy Cooverji Bhabha, N. C. Begg, Ronald Grenville-Mathers, Ali Mahaomed Kassim, Siva Rama Krishna Padmavati, J. D. Matthews, P. C. Mitchell, J. F. McHarg, S. E. Large, W. S. Watson, James Harper, William Macleod, Malcolm Macleod, H. B. Craigie, Sheila P. V. Sherlock.

The following were elected to the membership:

D. F. Cappell, D. M. Fraser, W. M. Millar, K. M. Robertson, Krishan Singh Grover, R. D. Minett, Prabhat Kumar Roy, Mary O'Mahony, R. D. Spooner, Sib Nath Mukherjee, E. T. Hughes, D. J. Hodges, Jyotish Chandra Ghosh, J. G. Sowerbutts, Sivaramakrishna Janaki, W. A. Penman, A. M. Womack, Naranjan Singh Dhillon, Eleanor C. Knox, Pravinchandra Valabhjee Vora, S. G. F. Matts, M. D. Kay, Lakhan Lal Sinha, Sangat Singh Syalee, Ellen S. Emslie, Donald Montgomery, T. D. Grant, G. P. McGovern, Chava E. Rotem, Tapas Kumar Chaudhuri, T. C. Dennison, P. S. Terespolsky, Promod Chiranjivlal Sharma, D. J. Robinson, Sanatkumar Vasantray Bakshi, A. J. Watson, Sureshchandra Sobhagchand Jhaveri, G. W. Ashcroft, J. S. Beck, W. K. C. Morgan, E. J. Raffle, J. R. Tighe, Puranmal Ganeriwala, J. A. Fuller, H. R. Klein, Om Prakash Gupta, I. W. Delamore, Amitabha Mitra, Jacob Dominian, Elliot Chesler.

Royal Faculty of Physicians and Surgeons of Glasgow

At the annual meeting of the Faculty on Nov. 3 the following office-bearers were elected:

President, Mr. Arthur Jacobs; visitor, Dr. J. H. Wright; honorary secretary, Dr. G. B. Shaw; honorary treasurer, Mr. R. B. Wright; honorary librarian, Dr. A. L. Goodall; representative on the General Medical Council, Dr. Andrew Allison; councillors, Dr. G. J. Aitken, Dr. W. Ferguson Anderson, Dr. W. Malcolm Gibson, Dr. D. McKay Hart, Dr. A. Cameron Macdonald, Dr. T. J. Thomson, Prof. G. M. Wyburn.

Dr. C. G. A. Thomas was presented with a prize for his essay on the Light of Many Minds.

College of General Practitioners

The James Mackenzie lecture will be given by Dr. G. F. Abercrombie at 11.30 A.M. on Saturday, Nov. 22, at B.M.A. House, Tavistock Square, W.C.1. Its title is the Art of Consultation.

Institute of Neurology

On Monday, Nov. 24, at 5.30 P.M., at the institute, the National Hospital, Queen Square, London, W.C.1, Prof. J. N. Cumings will give his inaugural professorial lecture. He is to speak on neuro-chemistry and neuro-chemists.

Drummond Fellowship for Research in Nutrition

Applications are invited by Jan. 31 for a senior fellowship (£1100 per annum) or a junior fellowship (£500 per annum). Particulars may be had from the hon. secretary, Drummond Trust, University College, Gower Street, London, W.C.1.

Fulbright Travel Grants

Travel grants will again be available next year to citizens of the United Kingdom to go to the United States of America for academic or educational purposes. Full particulars may be had from the United States Educational Commission in the United Kingdom, 71, South Audley Street, London, W.1.

Quaker Medical Society

On Tuesday, Nov. 25, at 8 P.M., in the Small Meeting House, Friends House, Euston Road, London, N.W.1, Mr. Basil Hume will give the Lister lecture. His subject will be Their Lives Are In Our Hands.

Epsom College Scholarship

The council of the college invite applications for one or more Henry Robinson scholarships (£250 p.a.), tenable from September.

These scholarships are open only to sons of medical men or women, aged between 12 and 14 on Jan. 1, 1959. They are awarded on the results of a competitive examination, and there is no means test. 5 or 6 open scholarships (£150 p.a.) will be given on the results of the same examination, and these are open also to sons of the laity. Further details can be had from the headmaster, Epsom College, Epsom.

Royal College of Obstetricians and Gynæcologists

At the annual dinner held in London on Nov. 7, Sir Malcolm Trustram Eve spoke of the pride the college can justifiably feel in the first thirty years' work, which has spread over the Commonwealth.

When chairman of a teaching hospital he had once tried to break the fundamental rule that obstetrics must never be divorced from gynæcology, and of course he had failed—though "I was right!" As "principal agent of your new landlord, the Sovereign" he was glad that the Crown has granted the college its lease in Regent's Park. The commissioners were trying to retain all the Nash terraces, and their basic idea was that all buildings facing the park shall revert to residential use. A few privileged people were nevertheless to be allowed to carry on their activities in the residential zone, and the college, after going to the highest tribunal, had secured Sussex Lodge. After outlining the history of this house (now demolished) Sir Malcolm expressed a strong hope that the college will get the money required for its endowment.

Prof. Andrew Claye, the president, reported that the new building is going up steadily and should be near completion by the end of next year. The council had been determined to build on a scale worthy of the constitution of a wide collegiate body, and to produce something that will be both "a credit and a memorial to our forefathers". With this achieved, the college was at the beginning of a new era of progress. The munificence of Lord Nuffield had allowed a start to be made, and the sums already raised should pay for the building and its equipment. But a very large sum must still be found for maintenance when it comes into use.

Mr. John Peel proposed The Guests and Dr. T. F. Fox responded.

Postgraduate Medical School of London

At a reception on Nov. 6 staff, students, and guests met Lord Coleraine, the new chairman of the school committee. Lord Cottesloe, the preceding chairman, spoke of the keen regret that was felt at the absence of Lord Alexander of Tunis, now president of the school, who was prevented by illness from attending the reception.

School and University Relationships

On Saturday, March 14, the University of Leeds Institute of Education will hold a conference on this subject with particular reference to medicine. The speakers will include Prof. P. J. Moir, Prof. Albert Hemingway, and Prof. R. E. Tunbridge. Further particulars may be had from the secretary of the Institute, The University, Leeds, 7.

Medicine on Television

On Wednesday, Nov. 19, at 6.30 P.M., at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, the Scientific Film Association will hold a discussion on presenting medicine to the public on television. The principal speaker will be Mrs. Mary Adams, and the discussion will be opened by Mr. A. Dickson Wright, F.R.C.S.

Applications are invited from doctors, who are nationals of the Republic of Ireland, for an Eli Lilly travelling fellowship, tenable, for one year, in the United States of America. Completed application forms should reach the secretary of the Medical Research Council of Ireland, 50, Merrion Square, Dublin, by April 30.

Prof. W. C. W. Nixon has been elected a foreign member of the Turkish Society of Obstetrics and Gynæcology.

Mr. G. W. Woodhill has been appointed secretary of the St. John Ambulance Brigade.

Air Commodore G. H. Morley has been appointed honorary surgeon to the Queen in succession to Air Commodore D. A. Wilson, who has retired.

The United Hospitals Choir is to hold a choral and orchestral concert in aid of the Marie Curie Cancer Research Fund at Chelsea Town Hall on Tuesday, Nov. 25, at 7.30 P.M. Further particulars may be had from the secretary, Miss Janne Magrath, 18, West Side, Clapham Common, London, S.W.4.

CORRIGENDUM: *The Nephrotic Syndrome.*—In this leader, published last week, the third line of the first new paragraph on p. 1002 should begin: "demonstrated by *inulin* or urea clearance . . ."

Diary of the Week

NOV. 16 TO 22

Monday, 17th

HUNTERIAN SOCIETY
8.30 P.M. (Apothecaries' Hall, Black Friars Lane, E.C.4.) Bishop of Croydon, Mr. W. A. Fearnley-Whittingstall, Mr. V. B. Green-Armytage: This Society Accepts the Need for Human Artificial Insemination. (Discussion.)

Tuesday, 18th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. Mildred Creak: Child Health and Child Psychiatry—Neighbours or Colleagues? (Charles West lecture.)
BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. William Hayes: Bacterial Genetics and Gene Structure.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. J. S. Tompkinson: History and Present Day Practice of Contraception.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. G. C. Wells: Mechanisms of Epidermal Sensitisation.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) Dr. W. S. C. Copeman: Doctors and Disease in Tudor Times.

Wednesday, 19th

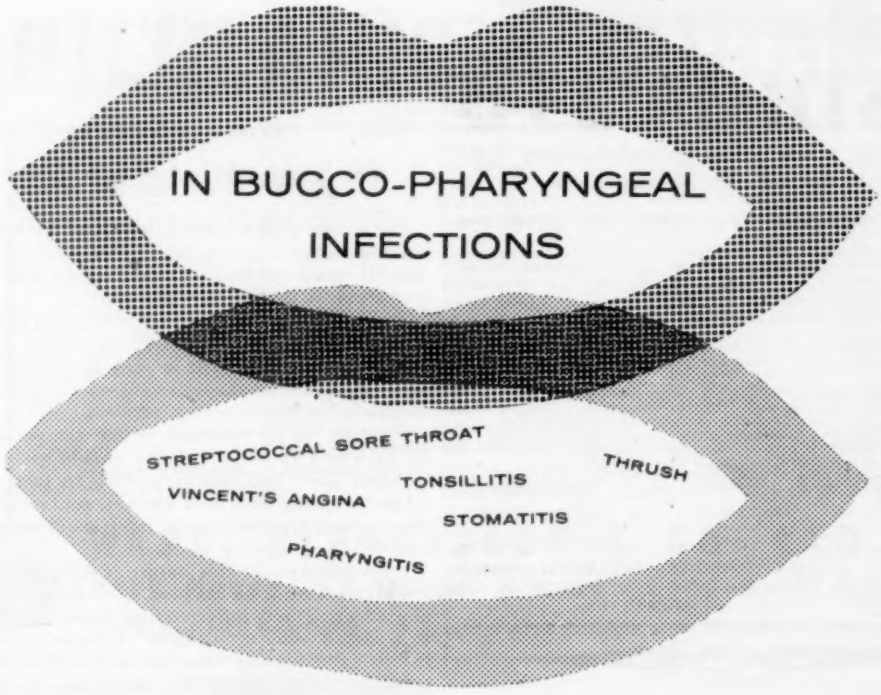
UNIVERSITY COLLEGE LONDON, Gower Street, W.C.1
5.30 P.M. Dr. D. A. Denton: Control of Secretion of the Transplanted Adrenal Gland.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.C.1
8.15 P.M. *General Practice.* Dr. Kenneth Milne, Sir Ralph Marnham, Dr. J. F. Stokes: Colonic Disorders.
POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
2 P.M. Dr. S. M. Cohen: Turnover of Plasma Proteins.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Mr. V. C. Thompson: Carcinoma of the Lung—Early Diagnosis.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. A. Dudgeon: Virus Disease.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Mr. J. Sharp Grant: Comments on the Development of Occupational Medicine
WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, W.6
8.30 P.M. Mr. J. Johnston Abraham: The West London 50 Years Ago.
NORTH WESTERN THORACIC SOCIETY
5 P.M. (Aintree Hospital, Liverpool.) Dr. D. L. Caldwell, Dr. G. Yates, Dr. M. Davies: Chronic Bronchitis.

Thursday, 20th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Dr. J. H. Humphrey: What are γ-Globulins?
ROYAL SOCIETY OF MEDICINE
4.45 P.M. *Dermatology.* Dr. J. S. Calnan, Dr. B. Rossatti: Histopathology of Chondrodermatitis Nodularis Helicis Chronica.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
4.30 P.M. (Chelsea Hospital for Women, Dovehouse Street, S.W.1.) Dr. D. M. Stern: Abnormal Uterine Hæmorrhage.
BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Dr. Frank Ellis, Dr. C. W. Wilson, Mr. D. E. A. Jones: The Use of the Rad as a Dose Unit in Radiotherapy.
HYPNOTHERAPY GROUP
8 P.M. (1, Wimpole Street, W.1.) Dr. Peter Scott: Crime and Adolescence.
UNIVERSITY OF BRISTOL, Bristol 8
8.15 P.M. Dr. Bernard Schlesinger: Rheumatoid Diseases in Childhood. (Carey Coombs lecture.)
MANCHESTER MEDICAL SOCIETY
8 P.M. (Staff House, University of Manchester.) *Anæsthetics.* Dr. A. J. Gray: On Veins and Needles. (Presidential address.)
LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
8 P.M. Mr. Harold Jackson Burrows: Prosthetic Replacement of Bone. (Hugh Owen Thomas lecture.)
HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Prof. James Walker: Fœtal Dissociation Curve for Oxygen.
UNIVERSITY OF ST. ANDREWS, Dundee
5 P.M. Dr. Agnes Macgregor: Changing Problems of Pædiatric Pathology.

Friday, 21st

ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Epidemiology and Preventive Medicine.* Dr. G. M. Carstairs: Social Factors in the Outcome of Mental Illness. Miss E. M. Brooke: A Longitudinal Study of Patients First Admitted to Mental Hospital.
8.15 P.M. *Radiology.* Mr. A. H. Jacobs, Dr. A. C. Thackray, Dr. T. M. Prossor: Testicular Tumours. Mr. Anthony Green: Technical Advance in Irradiation Technique.
POSTGRADUATE MEDICAL SCHOOL
10 A.M. Mr. T. Holmes Sellors: Diagnosis and Treatment of Atrical Septal Defects.
FACULTY OF RADIOLOGISTS
5 P.M. (Royal College of Surgeons of England, Lincoln's Inn Fields, W.C.2.) Lord Cohen of Birkenhead: Contribution of X-rays to the Basic Medical Sciences. (Crookshank lecture.)
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
2 P.M. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Dr. D. McKay Hart: Virus Diseases Complicating Pregnancy.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. Maxwell Ellis: Malignant Diseases of the Pharynx.
MIDLAND CENTRE FOR NEUROSURGERY, Smethwick Hospital, Holly Lane, Smethwick
8 P.M. Sir Russell Brain: Endocrine Exophthalmos.



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Academic and Educational

EMPIRE RHEUMATISM COUNCIL

FELLOWSHIPS—1959

Applications are invited by the Council for the following:

(*a*) A RESEARCH FELLOWSHIP, at a salary according to qualifications and experience of up to £1500 p.a., renewable annually for a period of 3 years, to prosecute research in the field of rheumatism.

(*b*) 2 GEIGY TRAVELLING FELLOWSHIPS, tenable for up to 1 year, to prosecute or study research on some aspect of the Rheumatic Diseases in a country other than that of normal residence. Salary according to qualifications and experience but not less than £1000 p.a. (pro rata for a lesser period than 1 year).

Medical or scientific qualifications are needed for the above Fellowships, and applications stating age, qualifications, experience, and details of proposed research (together with reason for selection of place of study in the case of (*b*) above), should be sent, together with the names of 2 referees, to the General Secretary, Empire Rheumatism Council, Faraday House, 8/10, Charing Cross-road, London, W.C.2, before 15th December, 1958.

SYMPOSIUM ON BRONCHIAL ASTHMA

WEDNESDAY, 25TH FEBRUARY, 1959. Royal Society of Medicine, London.

Chairman (Morning), J. L. LIVINGSTONE, F.R.C.P.;
(Afternoon) Sir GEOFFREY MARSHALL, K.C.V.O., C.B.E., F.R.C.P.

Fee 30/-.

Details from National Association for Prevention of Tuberculosis and Diseases of the Chest and Heart, Tavistock House North, Tavistock-square, London, W.C.1.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON). Applications are invited for the appointment of SENIOR LECTURER in the Department of Medicine. Candidates should have appropriate higher qualifications and have had experience in the investigation of metabolic problems in clinical medicine. The commencing salary will be within the scale £1800–£100–£2500.

Applications (6 copies), together with the names of 3 referees, should be sent before 30th November, 1958, to the Secretary, King's College Hospital Medical School, Denmark Hill, London, S.E.5, from whom further particulars may be obtained.

ABERDEEN. DUNFERMLINE COLLEGE OF PHYSICAL EDUCATION. Women applicants are invited to apply for the post of PRINCIPAL LECTURER IN ANATOMY AND PHYSIOLOGY AND HEALTH EDUCATION. The applicant should be a medical graduate, and it is hoped that she would be interested in research into aspects of physical education. Her duties would include the routine medical examination of students in training and candidates before entrance, but not the ordinary medical attendance on students. The salary scale is £1515–£50–£1715, plus equal-pay increments to £1961, with placing according to qualifications and experience. This post will be vacant in April, 1959.

Application forms and conditions of appointment may be obtained from the Principal, Dunfermline College of Physical Education, Woolmanhill, Aberdeen, to whom the completed forms of application, with letter stating qualifications in detail, should be sent as soon as possible and not later than Friday, 28th November, 1958.

THE UNIVERSITY OF MANCHESTER. Applications are invited for the post of TUTOR IN MEDICINE. Salary £1050 p.a. with membership of Children's Allowance Scheme. The Tutor will be required to give instruction in clinical medicine and supervise the studies of students during their period of clinical apprenticeship. In addition the Tutor will be required to take part in the clinical and research activities of the Department of Medicine. A higher qualification in medicine will be considered an advantage.

Applications should be sent not later than 1st December, 1958, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for the post of LECTURER or RESEARCH ASSISTANT IN BACTERIOLOGY AND VIROLOGY to begin duties on 1st January, 1959, or as soon thereafter as possible. Salary scales: Lecturer (*a*) for candidates holding a registered medical qualification £1200–£100–£1900; (*b*) for other candidates £900–£50–£1350–£75–£1650. The salary of the Research Assistant would be determined at the time of appointment. For either post the commencing salary will be according to qualifications and experience, with F.S.S.U. provision and family allowance.

Further particulars should be obtained from the Registrar, to whom applications (6 copies) should be sent by 6th December, 1958.

DALHOUSIE UNIVERSITY, Halifax, Nova Scotia, Canada. Required, PHYSIOLOGIST to direct and to conduct research in human pulmonary physiology. Full-time appointment in the Departments of Physiology and Medicine, with rank and pay of assistant professor or associate professor depending on qualifications.

Apply to Dean of the Faculty of Medicine.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street, W.C.1. (183 Beds.) A vacancy for a SENIOR HOSPITAL MEDICAL OFFICER, 2 half-days a week, exists on the medical staff of this Hospital. Candidates should be Fellows or Members of the Faculty of Homœopathy. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, before 19th December, 1958.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of CONSULTANT GYNÆCOLOGIST for 1 or 2 sessions a week, at the above Hospital. The post is available immediately.

Applications, quoting age, education, experience, and giving the names of 3 referees, should reach the House Governor by 30th November, 1958.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for a post of CONSULTANT in the Radiotherapy Department at the above Hospital. The post is available immediately and is for 5 sessions a week. A member of the Department is a candidate.

Applications, quoting age, education, experience, and giving the names of 3 referees, should reach the House Governor by 30th November, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT SURGEON (2 half-days per week) for the Battersea and Putney Group of hospitals. Duties mainly at Putney Hospital, S.W.15. Post vacant April, 1959.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, by 13th December, 1958. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT NEUROLOGIST (2 half-days per week) for the Battersea and Putney Group. Duties mainly at Bolingbroke Hospital, S.W.11.

Applications by letters (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, by 13th December, 1958. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) for St. John's Hospital, Battersea, S.W.11, to undertake diagnosis and treatment of acute psychiatric cases in a busy Mental Observation Unit, to manage a senile dementia unit, and act as Psychiatrist to large geriatric unit. Successful candidate will work under supervision of visiting Consultants and have assistance of a Registrar, and be required to take active part in scheme of reorganisation of the department. Candidates should possess the D.P.M. and have good experience in psychiatry.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, by 6th December, 1958. Applicants may visit Hospital by local arrangement.

ST. THOMAS'S HOSPITAL, London, S.E.1. Applications are invited for the post of Part-time PHYSICIAN with full Consultant status and membership of the Medical Committee. 4 half-day sessions per week.

Applications (12 copies), naming 3 referees, to Clerk of the Governor by 20th December, 1958.

AMENDED ADVERTISEMENT

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. Applications are invited for the post of CONSULTANT PHYSICIAN in Charge of the Department of Dermatology, attending 3 sessions per week. Applicants should hold the Fellowship or Membership of the Royal College of Physicians of London.

Further particulars and form of application, which must be returned not later than 8th December, 1958, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. Applications are invited for the post of CONSULTANT PATHOLOGIST in Charge of the Department of Chemical Pathology. The candidate may elect to be either full-time or maximum part-time.

Further particulars and form of application, which must be returned by Monday, 8th December, 1958, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

BRISTOL. UNITED BRISTOL HOSPITALS. Applications are invited for the whole-time appointment of CONSULTANT RADIOLOGIST.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be sent to the Secretary to the Board, Bristol Royal Infirmary, Bristol, 2 (from whom further particulars can be obtained), by Monday, 1st December, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Consultant in Dentistry (8 notional half-days per week) at hospitals in the Bradford and Wakefield areas. Applicants should have a higher dental qualification and be experienced in maxillo-facial work. The successful candidate will be required to reside in the Bradford area.

Applications (12 copies), stating age, qualifications, and details of present and previous appointments, with dates, and names and addresses of 3 referees, to the Secretary, Park Parade, Harrogate, by 9th December, 1958.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the post of CONSULTANT PATHOLOGIST (whole-time or maximum part-time sessions) to hospitals in the South Liverpool Hospital Management Committee Group and to the Liverpool Radium Institute. Applicants should possess a higher qualification and have at least 5 years' experience in pathology.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, Pearl Assurance House, 55, Castle-street, Liverpool, 2, to be returned not later than 6th December, 1958.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time SENIOR HOSPITAL MEDICAL OFFICER RADIOLOGIST to the Lancaster and Kendal Group of hospitals (Royal Lancaster Infirmary, Queen Victoria Hospital, Morecambe, and Westmorland County Hospital, Kendal, &c.). Good experience and higher qualification required, appointee (who will work under direction of the Consultant Radiologist) to live in or near to Lancaster.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 24th November, 1958.

MANCHESTER. UNITED MANCHESTER HOSPITALS. Applications are invited for 2 posts of CONSULTANT SURGEON at the Manchester Royal Infirmary, each for 8 sessions a week. The successful candidates will be expected to spend an appropriate time in research in addition to clinical and teaching duties.

Applications (12 copies), with the names of 3 referees, should be sent to the undersigned not later than 13th December, 1958, from whom further particulars may be obtained.

A. B. SCOTT, Secretary to the Board of Governors.

United Manchester Hospitals, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. Applications are invited for a post of CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST to commence on 20th August, 1959, with 8 sessions a week at St. Mary's Hospitals. The successful applicant, in addition to his clinical duties, will be expected to engage in the clinical instruction of undergraduate and postgraduate medical students and to undertake research in obstetrics and gynæcology.

Applications (12 copies), with the names of 3 referees, should be sent to the undersigned not later than 13th December, 1958.

A. B. SCOTT, Secretary to the Board of Governors.

United Manchester Hospitals, Manchester, 13.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. BEDFORD GENERAL HOSPITAL. (424 Beds.) Locum Tenens ORTHOPÆDIC SURGEON of Consultant, Senior Hospital Medical Officer, or Senior Registrar status required immediately for up to 7 sessions weekly. Probable duration 3 months. Remuneration according to status.

Apply to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford. Telephone 5401, Extension 22.

OXFORD REGIONAL HOSPITAL BOARD. Consultant in General Medicine, whole-time or maximum part-time, to the Area Department in General Medicine of the Swindon/Cirencester area, based on the new Princess Margaret Hospital, Swindon (80 general medical beds). Applicants must have wide experience in general medicine, and a higher qualification is essential.

Applications, stating age, experience and qualifications, and giving the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 6th December, 1958.

SHEFFIELD REGIONAL HOSPITAL BOARD. ConSULTANT ANÆSTHETIST (maximum part-time) required at Leicester. At least 50 % of the time will be spent at the Thoracic Unit, Leicester Isolation Hospital, and Chest Unit; remainder of time in general hospitals.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 6th December, 1958.

SHEFFIELD REGIONAL HOSPITAL BOARD. 2 ConSULTANT PHYSICIANS (maximum part-time) required, with duties at hospitals in the Derby area.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 13th December, 1958.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT GERIATRICIAN to the Caernarvon and Anglesey Hospital Management Committee area. Successful candidate will assist in planning, establishing and maintaining a geriatric service at Conway Hospital, with visits to other hospitals where there are chronic sick beds. Will also be required to undertake the domiciliary investigation of patients and establish close liaison with general practitioners and local health authorities and to reside in Caernarvon and Anglesey Hospital Management Committee area. Further particulars obtainable on request.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT GERIATRICIAN to the Merthyr and Aberdare and part of Brecon and Radnor Hospital Management Committee area. Successful candidate will be responsible for establishing and maintaining a geriatric service at St. Tydfil's Hospital, Merthyr, with visits to other hospitals where there are chronic sick beds. Will also be required to undertake the domiciliary investigation of patients and establish close liaison with general practitioners and local health authorities. Expected to reside in Merthyr and Aberdare Hospital Management Committee area. Further particulars obtainable on request.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST, Morgannwg Hospital, Bridgend (2359 Beds). Applicants must have had wide experience in psychiatry, hold a Diploma in Psychological Medicine, be competent to take clinical responsibility and to participate in the work of the Associated Outpatient Clinics and Domiciliary Consultant Service in the area served by the Hospital. Electroencephalographic experience will be an additional advantage. Married accommodation available if required.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Consultant RADIOLOGIST, Clwyd and Deeside Hospital Management Committee. Based at Royal Alexandra Hospital, Rhyl, with visits to other hospitals in the area. Successful candidate will be required to live within Hospital Management Committee area. Optional whole-time/maximum part-time appointment.

Applications (12 copies) to Senior Administrative Medical Officer, Welsh Regional Hospital Board, Temple of Peace, Cathays Park, Cardiff, with 21 days.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a post as CONSULTANT NEUROSURGEON with headquarters at the Royal Victoria Hospital, Belfast. The appointment will be on a part-time basis of 9 half-days per week and the terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 31st December, 1958.

NEW ZEALAND. NORTH CANTERBURY HOSPITAL BOARD, CHRISTCHURCH, NEW ZEALAND. Applications, closing at 9 A.M. on Monday, 1st December, 1958, are invited from Medical Officers with suitable qualifications and experience for the position of CHEMICAL PATHOLOGIST to the Board. The position will carry the designation of Junior Specialist or Senior Specialist, under the Hospital Employment Regulations, depending upon the qualifications and experience of the successful applicant.

Schedule of information and conditions of appointment available from the Secretary, North Canterbury Hospital Board, Christchurch, to whom applications should be addressed.

SOUTH AFRICAN BLOOD TRANSFUSION SERVICE. SEROLOGIST. Applications are invited from practitioners with experience in hæmatology, serology, and blood-transfusion. Salary £1800–£100–£2600 plus emoluments equivalent to 12½ % of basic salary in first year, rising to 17½ % after 10 years; also provident fund and leave privileges. Commencing notch may be advanced, depending on previous experience and qualification.

Apply to The Medical Director, The South African Blood Transfusion Service, P.O. Box 9326, Johannesburg.

Hospital Services: Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON (post recognised for the D.Obst.R.C.O.G.). Appointment is for a period of 6 months, vacant 1st December, 1958.

Applications, stating age, qualifications, with dates, and nationality, accompanied by copies of 3 recent testimonials, to the Secretary not later than 21st November, 1958.

ARCHWAY GROUP LABORATORY, WHITTINGTON HOSPITAL, N.19. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR (clinical pathology). Considerable experience desirable. Duties entail share of emergency and weekend attendance. The post provides extensive experience in bacteriology, biochemistry and hæmatology, and opportunity to work for higher qualifications. Laboratory may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley Park, N.6, by 24th November, 1958.

CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. Vacancies for House Officers. Applications are invited for appointment to the undermentioned recognised pre-registration posts which fall vacant on 1st January, 1959:—

(1) At **Dulwich Hospital** (in association with King's College Hospital Medical School for teaching purposes), **East Dulwich-grove, S.E.22**

HOUSE OFFICER (general medical duties)—4 positions.
HOUSE OFFICER (general surgical duties)—3 positions.

(2) At **St. Giles' Hospital, St. Giles'-road, Camberwell, S.E.5**

HOUSE OFFICER (general medical duties)—1 position.
HOUSE OFFICER (general surgical duties)—1 position.
HOUSE OFFICER (casualty, with general surgery, E.N.T., and eye duties)—1 position.
HOUSE OFFICER (orthopædic duties)—1 position.

Applications, giving age, qualifications, and details of previous post (if any), with copy testimonials or names of 2 referees, to be sent to the Group Secretary, Camberwell Hospitals Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 29th November, 1958.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Surgical and Urological Department. Post vacant 1st January, 1959. Post recognised for F.R.C.S.

Applications, with 2 testimonials, to Medical Director by 22nd November, 1958.

CHILDREN'S HOSPITAL, Sydenham, S.E.26. Senior RESIDENT MEDICAL OFFICER (Senior House Officer grade) required for 1 year. Duties include medicine and surgery. Recognised for D.C.H. Previous pædiatric experience essential.

Apply, naming 2 referees, to Administrative Officer by 24th November.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE SURGEON required for 6 months. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of REGISTRAR with duties jointly in the Department for Diseases of the Skin and in the Professorial Medical Unit.

Forms of applications, obtainable from the Deputy Superintendent, should be returned, naming 2 referees, by 6th December.

MIDDLESEX HOSPITAL, W.1. Applications invited for 2 posts of SURGICAL REGISTRAR, vacant 1st January.

Forms of application, obtainable from the Deputy Superintendent, should be returned, naming 2 referees, by 29th November.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. HOUSE PHYSICIAN (pre-registration) required on 16th December.

Applications, stating age, nationality, qualifications and experience, with the names of 3 recent referees, should be sent to the Secretary at the above address not later than 29th November.

EASTMAN DENTAL HOSPITAL AND INSTITUTE OF DENTAL SURGERY (UNIVERSITY OF LONDON), Gray's Inn-road, London, W.C.1. Applications are invited for the full-time non-resident post of ANÆSTHETIST in the grade of Registrar. Remuneration and conditions of service in accordance with national scales.

Application forms are obtainable from the Director, to whom they should be returned by 30th November, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE PHYSICIAN for Medicine and Pædiatrics to become vacant 1st January, 1959. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 20th November, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE PHYSICIAN. Appointment for 6 months from 1st January, 1959. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 20th November, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of OBSTETRIC HOUSE SURGEON (recognised for the M.R.C.O.G.). Duties to commence 1st January, 1959. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 20th November, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE SURGEON. Appointment for 6 months from 1st January, 1959. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 20th November, 1958.

QUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR (mid-grade) in the Department of Ophthalmology, with attendance on 2 sessions per week. Duties will commence as soon as possible until 30th September, 1959, in the first instance.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 27th November, 1958.

QUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR in the Radiotherapy Department; duties to commence as soon as possible. The post will be tenable until 30th September, 1959, in the first instance. Higher qualifications would be an advantage, but there would be opportunities for studying for the D.M.R.T. Parts I and II.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 27th November, 1958.

QUY'S HOSPITAL, S.E.1. Applications are invited for the post of SENIOR REGISTRAR in the Department of Neurology with duties from 1st January, 1959, until 30th September, 1959, in the first instance.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 27th November, 1958.

QUY'S-MAUDSLEY NEUROSURGICAL UNIT. Applications are invited for the post of REGISTRAR for 1 year commencing 1st December, 1958. Previous experience in neurosurgery essential. The Unit, which is housed in the Maudsley Hospital, serves both Guy's Hospital, and the Bethlem Royal and the Maudsley Hospitals.

Applications should be made by 25th November to K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark Hill, S.E.5.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics), vacant 10th December. The Senior House Officer works directly under the Consultant in a 36-Bed unit; the post offers excellent experience and is recognised for the F.R.C.S.

Apply Group Secretary, above address, by 21st November, quoting HH/O.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.) (with duties also in casualty and special departments, as necessary), and should be sent to Secretary, above address, by 24th November, quoting SHO/E.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), vacant 10th December. The Department is supervised by the Orthopædic Surgeon, and the post is recognised for the F.R.C.S.

Apply Secretary, above address, by 21st November, quoting HH/CO.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) SENIOR HOUSE OFFICER (obstetrics and gynæcology). Resident post vacant 19th December. Recognised for M.R.C.O.G.

Apply Secretary, above address, by 24th November, quoting SHO/O.

HAMMERSMITH HOSPITAL AND INSTITUTES OF OBSTETRICS AND CHILD HEALTH, Ducane-road, London, W.12. RESIDENT PÆDIATRIC REGISTRAR required. Post vacant 1st February, 1959. Duties involve care of newborn babies in Maternity Department and Premature Baby Unit.

Detailed applications, names 2 referees, to Secretary, Board of Governors, Hammersmith Hospital, Ducane-road, W.12, by 29th November.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. ORTHOPÆDIC HOUSE SURGEON, Senior House Officer grade. Some E.N.T. and emergency general surgery. New operating-theatre, Outpatient and Casualty Department.

Applications, with copies of 3 testimonials, and name and address of 1 referee, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to begin 1st January, 1959. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Friday, 28th November, together with copies of 3 recent testimonials.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE PHYSICIAN to become vacant on 22nd December, 1958. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Friday, 28th November, together with copies of 3 recent testimonials.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcological Departments to become vacant on 18th December, 1958. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Friday, 28th November, together with copies of 3 recent testimonials.

KING'S COLLEGE HOSPITAL, Denmark Hill, S.E.5 Applications are invited for the post of SENIOR REGISTRAR to the Department of Neurology (Dr. Macdonald Critchley and Dr. S. Nevin). The post is tenable from 1st January, 1959, until 30th September, 1959, in the first instance, renewable thereafter annually.

Applications, together with the names of 2 referees, should be sent to the undersigned not later than 29th November, 1958.

S. W. BARNES, House Governor.

LAMBETH GROUP HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited from registered medical practitioners (Women) for the post of SENIOR HOUSE OFFICER in Anæsthetics, based on the South London Hospital for Women. Vacant 31st December, 1958.

Application forms from the Secretary, South London Hospital for Women, Clapham Common, S.W.4.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. (General Hospital of 158 Beds.) Applications are invited to fill the post of HOUSE SURGEON (general). Pre-registration post. Applications by post-registration candidates will also be considered.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary by 25th November, 1958.

NEASDEN HOSPITAL (Acute Infectious Diseases), Brentfield-road, London, N.W.10. SENIOR HOUSE OFFICER, whole-time, resident, required. Now vacant. Hospital offers wide clinical experience and excellent opportunities for post-graduate studies.

Applications to the Physician-Superintendent.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (whole-time) to the Lyshoim X-ray Department at The National Hospital, Queen-square, London, W.C.1, to commence 1st January, 1959. This post carries the grade of Registrar. Applicants should hold a Diploma in Diagnostic Radiology and have had experience in general radiology. The appointment will be for 6 months in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 24th November, 1958.

H. EWART MITCHELL, Secretary to the Board of Governors.
The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON at The National Hospital, Queen-square, W.C.1, to commence 1st January, 1959. There are 2 vacancies. These posts carry the grade of Registrar. The appointments will be for 6 months in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 24th November, 1958.

H. EWART MITCHELL, Secretary to the Board of Governors.
The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of NON-RESIDENT HOUSE PHYSICIAN at The National Hospital, Queen-square, W.C.1, to commence 1st February, 1959. There are 2 vacancies. These posts carry the grade of Senior House Officer. The appointments will be for 6 months.

Applications, with names of 3 referees, to be sent to the undersigned not later than 24th November, 1958.

H. EWART MITCHELL, Secretary to the Board of Governors.
The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NORTH MIDDLESEX HOSPITAL, London, N.18. ADMISSIONS OFFICER (Senior House Officer grade). 6 months' appointment (with possible extension to 1 year), starting 1st January, 1959. Non-resident. A busy post in a new department. Evenings and weekends (from 1 P.M. Saturday) free.

Applications, giving details of qualifications and experience, together with copies of recent testimonials and/or names of 2 referees, should reach the Secretary of the Hospital not later than 19th November.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited from pre-registration and registered medical practitioners for 4 posts of RESIDENT HOUSE SURGEON. 6-month appointments. Vacant beginning of January, 1959. All posts recognised for F.R.C.S.

Applications, stating age, qualifications, experience, with copies of testimonials, to Secretary of Hospital, by 26th November.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN (general medicine). 6-month appointment, starting 1st January, 1959. Approved pre-registration post (first or second).

Applications, stating age, qualifications, experience, with copies of testimonials, to Secretary of Hospital, by 26th November.

NORTH MIDDLESEX HOSPITAL, London, N.18. Casualty OFFICER (Senior House Officer grade). 6 months' appointment, starting 1st January, 1959. Non-resident post, recognised for F.R.C.S. 3 Casualty Officers employed; duties include service with the 3 main surgical units.

Applications, giving details of qualifications and experience, together with copies of recent testimonials and/or names of 2 referees, should reach the Secretary of the Hospital not later than 19th November.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer) to the above Hospital for a period of 6 months, vacant 6th December, 1958.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 26th November, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE SURGEON (pre-registration) required for 6 months commencing 2nd January, 1959. Post recognised for F.R.C.S.

Applications, with copies of recent testimonials, to Hospital Secretary by 22nd November, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. SENIOR HOUSE SURGEON (Senior House Officer grade) required for 6 months, commencing 5th December, 1958. Post recognised for F.R.C.S.

Applications, with the names of 3 referees, to Hospital Secretary by 22nd November, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (pre-registration) required for 6 months, commencing 2nd January, 1959.

Applications, with copies of recent testimonials, to Hospital Secretary by 22nd November, 1958.

REGIONAL NEUROSURGICAL CENTRE. (66 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery). Vacant 1st December. Post recognised for F.R.C.S. and D.P.M., and provides excellent opportunity for training in neurology.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ROYAL FREE HOSPITAL GROUP. Applications are invited from registered Women medical practitioners for 2 resident posts of REGISTRAR in Gynæcology and Obstetrics:—

1. To work at Elizabeth Garrett Anderson Hospital from 1st December, 1958.
2. To work at Elizabeth Garrett Anderson and Hampstead General Hospitals, from 1st January, 1959.

Appointments for 1 year in the first instance.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 21st November, 1958.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC REGISTRAR (non-resident) from 1st January, 1959. This post will provide experience for 1 year at the Royal Free Hospital and 1 year at Heatherwood Orthopædic Hospital which is a Regional Orthopædic Centre.

Application forms may be obtained from the Secretary to the Board of Governors at the above address, to whom they should be returned as soon as possible.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER to the Radiotherapy Department. Applicants should be registered medical practitioners, and the appointment is suitable for a candidate doing a postgraduate course in radiotherapy. The appointment is for 1 year in the first instance. Duties to commence on 1st January, 1959.

Application forms may be obtained from the Secretary to the Board of Governors, to whom they should be returned as soon as possible.

ST. ANDREW'S HOSPITAL, Devons-road, Bow, E.3. HOUSE SURGEON (obstetrics and gynæcology). Recognised pre-registration post.

Applications, with copy of at least 1 testimonial, should be sent to Hospital Secretary immediately.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) to above Hospital, for duty in the Infectious Diseases Unit and other general duties, for a period of 6 months from 5th December, 1958.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 29th November, 1958.

ST. CLEMENT'S HOSPITAL, Bow, E.3. House Physician (not pre-registration) for general medical wards. Post vacant January, 1959.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be sent to Hospital Secretary immediately.

ST. GEORGE'S HOSPITAL, S.W.1, and ST. PETER'S HOSPITAL, CHERTSEY. Applications are invited for the post of REGISTRAR to the Department of General Surgery. This is a joint appointment between St. George's Hospital, Hyde Park Corner, S.W.1, and St. Peter's Hospital, Chertsey. Candidates should hold the diploma of the F.R.C.S.(Eng.). The appointment will be for 1 year in the first instance and the successful candidate, will be required to take up duty on, or as soon as possible after, 1st January, 1959.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 29th November, 1958.

P. H. CONSTABLE, House Governor.

ST. GEORGE'S HOSPITAL, S.W.1, and WINCHESTER AND SOUTHAMPTON GROUPS OF HOSPITALS. Applications are invited for the post of REGISTRAR to the Department of Paediatrics. The successful candidate will work jointly between St. George's Hospital Children's Department at the Victoria Hospital for Children and the Winchester and Southampton Groups of hospitals. Candidates should have had good experience of work in a Children's Hospital and should hold the D.C.H. Membership of the Royal College of Physicians would be an advantage. The appointment will be for 1 year in the first instance and the successful candidate will be required to take up duty on 1st March, 1959.

Applications, stating age, education, qualifications and experience, together with the names of 2 referees, should reach the undersigned not later than 29th November, 1958.

P. H. CONSTABLE, House Governor.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN. Inpatient Department, Homerton-grove, London E.9. REGISTRAR in Clinical Pathology. Appointment for 1 year in the first instance. The post offers opportunities for the study of histopathology of the skin and will be vacant on 1st February, 1959.

Applications addressed to the Secretary to the Board of Governors, Lisle-street, Leicester-square, W.C.2, not later than 1st December, 1958, giving the names of 3 referees.

ST. MARY'S HOSPITAL, W.2. Casualty Surgeon, graded Senior House Officer (non-resident), required for first period of 6 months from 1st January, 1959.

Applications, giving full details, with names and addresses of 3 referees, should reach the House Governor not later than 25th November, 1958.

ST. MARY'S HOSPITAL, W.2. Surgical Registrar (non-resident), for first period of 12 months from 31st December, 1958, to work half-time in the Surgical Unit and half-time in the Casualty Department. F.R.C.S. qualification desirable.

Applications, giving full details, and names and addresses of 3 referees, should reach the House Governor not later than 25th November, 1958.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (pre-registration). General medicine and some tuberculosis. Resident. Vacancy approximately 18th December.

Applications, naming 2 referees, to Medical Superintendent within 14 days.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN for duty in Rheumatism Unit, resident. This post offers valuable experience in general medicine and specialised experience in rheumatic and connective tissue diseases, and is very suitable for candidates wishing to take membership. Vacancy 23rd December.

Applications, naming 2 referees, to Medical Superintendent.

ST. THOMAS'S HOSPITAL, London, S.E.1. Applications are invited from fully registered medical practitioners for the following appointments:—

Non-resident:

SENIOR HOUSE OFFICER to the Children's Department for 1 year from 24th February, 1959.

Resident:

2 SENIOR RESIDENT ANÆSTHETISTS (Senior House Officer grade). Renewable for second 6 months.

SENIOR MEDICAL CASUALTY OFFICER AND RESIDENT PATHOLOGIST (Senior House Officer grade).

SENIOR SURGICAL CASUALTY OFFICER (Senior House Officer grade).

SENIOR HOUSE OFFICER or HOUSE OFFICER to the Thoracic Surgical Unit (grade according to qualifications and experience).

HOUSE PHYSICIAN to the Children's Department.

HOUSE PHYSICIAN to the Department of Psychological Medicine.

HOUSE PHYSICIAN to the Department of Neurology and Thoracic Medicine.

All for 6 months from 10th February, 1959.

Applications, naming 2 referees, to Clerk of the Governors by 26th November, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. Resident REGISTRAR to the Department of Anæsthetics for 1 year in the first instance from 1st February, 1959.

Applications, naming 2 referees, to Clerk of the Governors by 26th November, 1958.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy in January, 1959, for an ASSISTANT MEDICAL REGISTRAR (Registrar grade), with duties in the Departments of Physical Medicine and Neurology.

Further particulars and application form, to be returned by 8th December, obtainable from the House Governor.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. The office of RESIDENT ASSISTANT SURGEON (Senior Registrar grade) will be vacant in January, 1959.

Further particulars, and application forms, which must be returned by 8th December, may be obtained from the House Governor.

WANSTEAD HOSPITAL, London, E.11. (191 Beds.) (63 acute medical and 7 pædiatric medical beds.) HOUSE PHYSICIAN required. Pre- or post-registration candidates eligible. Post offers wide experience in general medicine.

Applications, with full details, and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. RESIDENT CASUALTY OFFICER (Senior House Officer grading) required early December for 6 months.

Detailed applications, copies of 2 recent testimonials, to Secretary, by 24th November.

WESTMINSTER CHILDREN'S HOSPITAL and ROYAL DEVON AND EXETER HOSPITAL, SOUTHERNHAY EAST, EXETER. WESTMINSTER HOSPITAL TEACHING GROUP. Applications invited for the joint appointment of PÆDIATRIC REGISTRAR to start 1st January, 1959. Annual appointment for 2 years. First year at Royal Devon and Exeter Hospital. Second year at Westminster Hospital for duties in Westminster Children's Hospital.

Applications (4 copies), with names of 3 referees, to Secretary, Westminster Children's Hospital, Vincent-square, London, S.W.1, by 1st December, 1958.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, London, N.W.10. MEDICAL REGISTRAR (non-resident) required. Post vacant 8th December. Hospital may be visited by direct appointment.

Application forms from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, Park Royal, N.W.10, by 29th November, 1958.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOS-PITAL, MID-WALES HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical) required (resident). Post recognised for F.R.C.S. examination. Vacancy immediate.

Applications, stating age, experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ACCRINGTON. VICTORIA HOSPITAL. (114 Beds.) HOUSE SURGEON required immediately. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

ARLESEY, BEDFORDSHIRE. THREE COUNTIES HOS-PITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL AREA. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Mental Hospital of 1300 Beds for work in the Hospital and Outpatient Clinics. Resident or non-resident. The Hospital is recognised for the D.P.M., and facilities will be given for taking this examination.

Application, with 2 recent testimonials, should be addressed to the Medical Superintendent as soon as possible.

ASHTON-UNDER-LYNE GENERAL HOSPITAL. ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Casualty Department at above Hospital. Appointment limited to 4 years. Minimum commencing salary £852 10s. p.a., but higher salary may be paid according to experience and qualifications. There may be some orthopædic duties to be undertaken by the holder of this post. Recognised under F.R.C.S. regulations. Vacant December.

Apply, giving age, experience, qualifications, and names of 2 referees, to Group Secretary, General Hospital, Ashton-under-Lyne.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDE-VILLE HOSPITAL. 2 RESIDENT HOUSE PHYSICIANS required for the Department of General Medicine. Recognised pre-registration post, but applications from registered practitioners also considered. Post vacant mid-December. Interviews 28th November.

Applications, with copies of 2 testimonials, to Administrative Officer, by 20th November.

BEBINGTON, WIRRAL, CHESHIRE. CLATTERBRIDGE HOSPITAL. CENTRAL WIRRAL GROUP. SENIOR HOUSE OFFICER (anæsthetics) required to fill vacancy for a 12-month period. Salary in accordance with current terms and conditions of service.

Application forms, obtainable from Secretary, to be returned immediately.

BEDFORD GENERAL HOSPITAL. (424 Beds.) House SURGEON required. Pre- or post-registration, recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute surgical units. Holder of this appointment will be favourably considered for appointment as House Physician at the termination of contract.

Applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (424 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. GENERAL SURGICAL REGISTRAR (resident) required at above Hospital.

Application forms obtainable from and returnable to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 8th December.

BEDFORD GENERAL HOSPITAL. (424 Beds.) 2 resident Pre-registration HOUSE PHYSICIANS required end November.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 24th November.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE PHYSICIAN (pre-registration) required immediately.

Applications, naming 2 referees, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEVERLEY, YORKSHIRE. BROADGATE MENTAL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER. Accommodation for married man available. Opportunity given for study and attendance at courses in Leeds.

Applications, giving details of present appointment, experience, and names of referees, to Group Secretary, Westwood Hospital, Beverley.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required for Area Laboratory. Offers experience in all branches of pathology.

Detailed applications to Group Secretary.

BISHOP AUCKLAND, Co. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) HOUSE PHYSICIAN required. Fully registered or provisionally registered practitioner.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, South West Durham Hospital Management Committee, at the above address.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTFORDSHIRE. (67 Beds—medical, surgical, and maternity.) Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (Male). Salary £819 10s. p.a., less £150 for residential emoluments. To commence 12th December, 1958.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, to Hospital Secretary, Herts and Essex General Hospital, Bishop's Stortford, Herts.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. (341 Beds.) SENIOR HOUSE OFFICER in Obstetrics and Gynæcology (Male or Female) to commence 30th December, 1958, for period of 12 months. Recognised post for D.Obst.R.C.O.G. Duties primarily with Obstetric Department (32 Beds) and Neonatal Nursery and approximately 15 gynæcological beds. Salary £819 10s. p.a., less £150 for resident facilities.

Applications, stating qualifications, nationality, age and experience, with copies of testimonials or names of 2 referees, to Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Locum ANÆSTHETIC REGISTRAR (resident) required full-time from 21st November, 1958, for period of 2–3 months.

Applications to Hospital Secretary (telephone: Bishop's Stortford 963).

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILI-TATION CENTRE, Bath-row, BIRMINGHAM, 15. SENIOR HOUSE SURGEON, 2 vacancies mid-December. Hospital is the largest traumatic unit in the country, treating 50,000 new patients a year, including 2000 burns. Ample opportunity for practical experience in all types of injury. Recognised for casualty training by Royal College of Surgeons.

Applications, naming 2 referees, to Administrator.

BIRMINGHAM. MOSELEY HALL HOSPITAL FOR CHILDREN, Alcester-road, BIRMINGHAM, 13. (65 Beds.) SENIOR HOUSE OFFICER (pædiatric). Vacant now. Resident/non-resident. Recognised for D.C.H.

Apply, with 3 testimonials, within 10 days, to Secretary, Birmingham (Selly Oak) Hospital Management Committee, Oak Tree-lane, Birmingham, 29.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER in the E.N.T. Department at the Queen Elizabeth Hospital.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned by 29th November, 1958.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the appointment of NON-RESIDENT REGISTRAR in the E.N.T. Department for duties within the United Hospitals, including the Children's Hospital. Applicants should have had previous experience in the specialty and have passed the Primary examination for the F.R.C.S.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned by 29th November, 1958.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER in the E.N.T. Department at the General Hospital.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned by 29th November, 1958.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. 2 RESIDENT GYNÆCOLOGICAL HOUSE SURGEONS—pre-registration or otherwise—required for duty 7th January, 1959. Recognised for M.R.C.O.G.

Application forms obtainable from House Governor at above address, to be returned not later than 29th November, 1958.

G. A. PHALP, Secretary.

BLACKPOOL VICTORIA HOSPITAL. (354 Beds.) HOUSE SURGEON. Resident pre-registration post available from mid-November, 1958, in the Department of Surgery at this well-equipped Hospital with excellent facilities for gaining experience. Recognised for F.R.C.S.

Applications, stating age, experience, and the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL VICTORIA HOSPITAL. (354 Beds.) HOUSE OFFICER (orthopædic and traumatic surgery). Resident pre-registration post recognised for F.R.C.S. available from mid-November, 1958, in the main acute General Hospital serving the Blackpool and Fylde area.

Applications, stating age, experience, and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL VICTORIA HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER (anæsthetics). Post recognised for F.F.A. R.C.S. and D.A. and vacant mid-November. This is a busy general hospital offering a sound and varied experience in anæsthetics.

Applications, giving age, qualifications, experience, and the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BOGNOR WAR MEMORIAL HOSPITAL. (32 Beds.) RESIDENT SENIOR HOUSE OFFICER required to work under visiting Consultant Surgeon and Physician, also casualty work. Salary £819 10s., less £150 p.a. for residence. Modern fully-equipped theatre. Good liaison with Chichester main hospitals and with local general practitioners. Also gives opportunity for postgraduate reading.

Apply, giving 3 referees' names, to Group Secretary, 174, Broyle-road, Chichester, Sussex.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HAMPSHIRE. (334 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN (pre-registration intern). The post becomes vacant on 11th December, 1958.

Applications to the Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HAMPSHIRE. (334 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE PHYSICIAN required 30th December, 1958–12th January, 1959 (inclusive).

Applications to the Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HAMPSHIRE. (334 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (pre-registration intern). The post becomes vacant on 11th December, 1958.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (general surgery) for a period of 3½ months, to commence 21st December, 1958. The post, which is resident, is recognised for the F.R.C.S. examination.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of 3 SENIOR HOUSE OFFICERS (orthopædics and casualty). These appointments, which become vacant on 1st December and 21st December, 1958, and 18th January, 1959, are recognised for the F.R.C.S. examination. The Unit now consists of 3 Senior House Officers and a Registrar.

Applications to the Hospital Secretary.

BRADFORD CHILDREN'S HOSPITAL, Yorkshire. Senior HOUSE OFFICER (Male or Female), vacant 9th December, 1958. Recognised for D.C.H.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Bradford Royal Infirmary, Bradford, Yorks.

BRENTWOOD, ESSEX. WARLEY HOSPITAL. Senior HOUSE OFFICER required. The Hospital is situated within easy reach of London by main line electric service and bus. There are over 2000 Beds and a wide experience of all types of mental disorders, including the neuroses, can be obtained. All modern treatments are carried out, including psychosurgery. Visiting Consultants in other specialties attend regularly. Teaching by senior staff and facilities for attending postgraduate courses are provided; also experience of outpatient clinics. Regular clinical meetings are held. Salary £819 10s. p.a., less £150 for excellent residential amenities if required—no accommodation available for married man.

Applications, with full details and names of 2 referees, to Physician-Superintendent.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) CASUALTY HOUSE SURGEON required end December. Full and varied experience in busy Casualty Department (staff of 3), and also duties in Orthopædic and Traumatic Unit, including charge of beds. Recognised for pre-registration and F.R.C.S.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer grade) required for busy Casualty Department (2 junior medical staff). Vacant early November. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Administrative Officer.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the pre-registration appointment of HOUSE SURGEON (orthopædics).

Applications, stating age, qualifications, and the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

BRIDGE OF EARN HOSPITAL. House Surgeon required for Fracture and Orthopædic Unit, Bridge of Earn Hospital, from now until end of January, 1959.

Applications, giving age, qualifications, experience, and names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. SENIOR HOUSE OFFICER, Regional Department of Neurosurgery. Vacant immediately, tenable for 6–12 months. The post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to Group Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Applications are invited for the following appointments which will become vacant on 1st February, 1959:—

Southmead Hospital, Bristol (570 Beds including 138 maternity)

1 HOUSE OFFICER (casualty) (will also have duties as E.N.T. House Surgeon)—post recognised for F.R.C.S. examination.

3 HOUSE SURGEONS—posts recognised for F.R.C.S. examination.

5 HOUSE PHYSICIANS.

1 HOUSE SURGEON (gynæcology)—post recognised for M.R.C.O.G. examination.

2 HOUSE OFFICERS (obstetrics)—post recognised for M.R.C.O.G. examination.

2 HOUSE PHYSICIANS (pædiatrics)—posts recognised for D.C.H.

Ham Green Hospital, Pill, near Bristol (430 Beds)

2 HOUSE PHYSICIANS.

Applications are also invited for 1 SENIOR HOUSE OFFICER (pædiatrics) at Southmead Hospital from 1st March; 2 HOUSE OFFICERS (obstetrics) at Southmead Hospital for 6 months, commencing 1st May, 1959; and 1 SENIOR HOUSE OFFICER (medical) at Snowdon Road Hospital, Fishponds, Bristol (300 Beds—chronic sick, general medical and dermatological cases) from 23rd February, 1959.

Applications, on forms to be obtained from the undersigned, to be returned not later than 3rd December, 1958.

C. C. HANCOCK, Group Secretary.

Southmead Hospital, Bristol.

BROMLEY HOSPITAL, Bromley, Kent. House Physician required December, for Geriatric Unit with beds at the Lennard and Farnborough Hospitals. Excellent experience in investigation and treatment of acute and chronic diseases in the elderly, and good facilities for study. Opportunity for experience with children (Infectious Diseases) at the Lennard Hospital.

Apply, stating full particulars, and naming 2 referees, to Administrative Officer, Bromley Hospital, Bromley, Kent.

BURNLEY VICTORIA HOSPITAL. (171 Beds.) Resident HOUSE OFFICER (surgical). The appointment is approved as a pre-registration post and recognised for F.R.C.S. Subject to satisfactory service, the successful applicant will be favourably considered for appointment as House Physician at the termination of contract as Surgical House Officer.

Applications, with 2 references, to Group Secretary, Burnley and District Hospital Management Committee, Burnley General Hospital.

BURTON-ON-TRENT GENERAL HOSPITAL. (251 Beds.) ANÆSTHETIST (Junior Hospital Medical Officer grade). Busy general base hospital for area. 8 residents. Excellent experience. Recognised for D.A. Married or single accommodation, furnished or unfurnished, as required.

Applications to Group Secretary, General Hospital, Burton-on-Trent, Staffordshire.

BURTON-ON-TRENT GENERAL HOSPITAL. (251 Beds.) CASUALTY OFFICER (Senior House Officer grade). Busy general base hospital for area. 8 residents. Full Consultant service. Excellent experience. Recognised for F.R.C.S. Married accommodation, furnished or unfurnished, available.

Applications to Group Secretary, General Hospital, Burton-on-Trent, Staffordshire.

BURTON-ON-TRENT GENERAL HOSPITAL. (251 Beds.) HOUSE SURGEONS (general), pre-registration. Busy general base hospital for area. 8 residents. Full Consultant service. Excellent experience. Recognised for F.R.C.S. Married accommodation will be available for a joint post.

Applications to Group Secretary, General Hospital, Burton-on-Trent, Staffordshire.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

CAMBRIDGE. UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL. REGISTRAR in Anæsthetics (non-resident) required.

Apply, with full particulars and names of 3 referees, to Secretary, Addenbrooke's Hospital, Cambridge, by 22nd November, 1958.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) E.N.T. and Eye Departments. SENIOR HOUSE OFFICER. Salary £819 10s. p.a. Post vacant January, 1959. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pathology) (non-resident), which is now vacant. The post is for 1 year. Salary £819 10s. p.a., with National Health Service conditions. Experience in pathology not essential, but candidates must have had previous clinical experience.

Applications, stating age, qualifications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6-month appointment. Post vacant mid-December. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF (near). PRINCE OF WALES ORTHOPÆDIC HOSPITAL, RHYDLAFAR, near CARDIFF. SENIOR HOUSE OFFICER required at above Hospital. Married or single accommodation available.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER (resident) required in Geriatric Unit (200 Beds) at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of REGISTRAR in Dermatology at the Cardiff Royal Infirmary, to commence duty 1st January.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR HOUSE OFFICER (non-resident) in the Casualty Orthopædic and Fracture Departments at the Cardiff Royal infirmary. The successful applicant will spend 8 months of the appointment in the Casualty Department and 4 months in the Orthopædic and Fracture Departments. Commencing December, 1958.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the post of RESIDENT GYNÆCOLOGICAL HOUSE OFFICER (pre- or post-registration) for the 6 months commencing 1st February, 1959. The post is recognised for the M.R.C.O.G.

Applications, stating age, qualifications and any previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent, Law Hospital, Carluke.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (733 Beds.) 2 HOUSE SURGEONS required on Surgical Unit of 78 Beds. Posts recognised for F.R.C.S. examination and approved for pre-registration experience. Vacant early December.

Applications, giving age, qualifications, &c., with copies of recent testimonials or the names and addresses of 2 referees, should be sent to the Secretary at above address.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (733 Beds.) HOUSE SURGEON (approved for pre-registration service). General surgery with duties in E.N.T. Vacant early December.

Applications, giving age, qualifications, &c., with copies of recent testimonials or the names and addresses of 2 referees, should be sent to the Secretary at above address.

CATERHAM, SURREY. ST. LAWRENCE'S (Mental DEFICIENCY) HOSPITAL. (2250 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required. Salary £852 10s.–£55–£1182 10s. p.a. Single residential accommodation available at a charge of £170 p.a.

Applications, giving full particulars and names of 2 referees, to Group Secretary by 29th November, 1958.

CHELMSFORD. ST. JOHN'S HOSPITAL. (65 surgical beds.) Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Senior House Officer grade). The post, which becomes vacant on 6th December, 1958, is recognised for the F.R.C.S., and the successful candidate will gain excellent experience in general surgery, with good opportunity for preparation for higher qualifications. A House Surgeon is in residence.

Applications, stating age, nationality, qualifications and experience, with dates, together with recent testimonials, to be received not later than 17th November, 1958, by the Group Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. House SURGEON (pre-registration, first or second post). To commence 1st December, 1958. The Hospital deals with a large number of routine and emergency cases. Recognised for training for the Fellowship of the Royal College of Surgeons.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 18th November, by the Group Secretary, Chelmsford Group Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. House PHYSICIAN (pre-registration, first, second, or third appointment). (Male or Female.) To commence 1st December, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 18th November by the Group Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON. Pre-registration post. The post will become vacant at the end of November, and offers good surgical experience. Recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, pre-registration post, to work in the general medical wards of the Hospital. Duties will commence on 13th December.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Rotating Internship. A vacancy occurs for a HOUSE SURGEON, pre- or post-registration, at the Cheltenham General Hospital. The successful candidate on completion of his 6 months will be offered the post of House Physician, followed by that of Resident Obstetric Officer in the Group, if desired.

Applications, stating age and experience and names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer (intern) grade). 100 orthopædic beds. Post recognised for F.R.C.S. and pre-registration service. Salary in accordance with terms and conditions of National Health Service. Post vacant 26th November, 1958.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, Surrey.

CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required at Whittington Hall, Chesterfield (356 Beds for female mentally deficient patients), and Scarsdale Hospital, Chesterfield, where there are 125 Beds for mental patients. Previous experience advantageous but not essential. Post offers ample opportunities for study. Small flat available within the Group if required.

Please apply, with names of 2 referees, to the Group Secretary at the Chesterfield Royal Hospital.

CHESTERFIELD ROYAL HOSPITAL. (269 Beds. Recognised for the D.A. and F.F.A. R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required 20th January, 1959. Additional duties, when required, at other hospitals in the group. Experience in all types of anæsthesia, except for neurosurgery, can be gained. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

COLCHESTER. ESSEX COUNTY HOSPITAL. (181 Beds.) Applications invited for post of SENIOR HOUSE OFFICER to Casualty and Radiotherapy Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester.

COVENTRY. GULSON HOSPITAL. (312 Beds.) RegisTRAR (general medicine). Duties mainly at Gulson Hospital. Experience in specialty essential. Higher qualifications desirable. Resident.

Application forms from Group Secretary, Coventry and Warwickshire Hospital, Stoney Stanton-road, Coventry, to be returned by 24th November.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (140 Beds.) Applications are invited for the vacant post of SENIOR HOUSE OFFICER in Surgery, which is recognised for the F.R.C.S. examinations. New twin operating-theatres and a new Casualty Department were opened recently. There are 7 residents, and there is ample opportunity for gaining experience in operative surgery and for study.

Please apply to the Group Secretary, Barony Hospital, Nantwich, Cheshire, within 10 days.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (140 Beds.) Applications are invited for the post of Locum SENIOR HOUSE OFFICER in Surgery.

Apply immediately to the Hospital Secretary.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Applications are invited for the post of HOUSE SURGEON (Intern or Senior House Officer). Post recognised for F.R.C.S.

Applications, with particulars of experience and copies of 2 recent testimonials, to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY (330 Beds), WESTERN HOSPITAL, DONCASTER. (241 Beds). (Post recognised for M.R.C.O.G.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required 2nd January, 1959. Gynæcology beds at both hospitals; maternity unit at Western Hospital. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

DONCASTER. WESTERN HOSPITAL. Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER in the grade of Junior Hospital Medical Officer.

Applications, stating age, qualifications and experience, together with copies of 3 recent testimonials, should be forwarded to the Group Secretary, Doncaster Hospital Management Committee, Doncaster Royal Infirmary.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) Applications are invited for the post of HOUSE OFFICER or SENIOR HOUSE OFFICER (paediatrics), vacant 1st January, 1959, tenable for 6 months. Duties mainly surgical but include some medicine. Post recognised for D.C.H. and is open to pre-registration graduates.

Applications, with names of 2 referees, to be sent as soon as possible to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY CITY HOSPITAL. (260 Beds. Post recognised for training for D.A. and F.F.A. R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required immediately for the above Hospitals. Duties also at other hospitals in the Group. This post offers special experience in neuro- and orthopædic surgery, and obstetrics. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

EDINBURGH. ROYAL HOSPITAL FOR SICK CHILDREN. Applications are invited from registered medical practitioners and pre-registration graduates for resident appointments of HOUSE PHYSICIAN for 6 months commencing 1st April, 1959. National Health Service scales.

Applications, stating age, qualifications and experience, with names of 2 referees, to be received not later than 29th November by the Secretary, Edinburgh Central Hospitals, 1, Rillbank-terrace, Edinburgh, 9.

EPPING. ST. MARGARET'S HOSPITAL. Resident HOUSE PHYSICIAN required from 17th November, 1958. Duties relating mainly to general medicine and children.

Applications immediately, with copies of 2 recent testimonials, to the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 11th December for General Surgery. Pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent, as soon as possible, to Group Secretary, at above address.

EXETER. DIGBY-WONFORD HOSPITAL. (611 Beds—mental.) JUNIOR HOSPITAL MEDICAL OFFICER required for duty principally at Digby. An extensive development scheme is in hand which includes 3 new units and which will provide excellent psychiatric experience. Facilities will be available for an officer preparing for the D.P.M. Unfurnished cottage available at moderate rental.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Group Secretary, Devon Mental Hospital Management Committee, Exminster Hospital, near Exeter.

GLASGOW NORTHERN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of SENIOR HOUSE OFFICER in the Department of Anæsthetics at Stobhill General Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment, and naming 2 referees, to be lodged with the Secretary, 13, Woodside-place, Glasgow, C.3, by 28th November.

GLASGOW, N.W. RUCHILL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Chest Department (medical unit). The Department consists of 200 Beds for the treatment of pulmonary tuberculosis and other diseases of the chest. There is attached to the Department a thoracic surgical unit of 60 Beds. Facilities are available for postgraduate study and research.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to Physician-Superintendent.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Urology. Duties at above Infirmary.

Write, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GOOLE. BARTHOLOMEW HOSPITAL. (44 surgical beds.) RESIDENT SENIOR HOUSE OFFICER required for general duties. Flat available on rental.

Applications, with copies of 3 recent testimonials, to Group Secretary, St. John's Hospital, Goole.

HEMEL HEMPSTEAD, HERTFORDSHIRE. ST. PAUL'S HOSPITAL. HOUSE PHYSICIAN (pre-registration) required to commence 29th December, 1958.

Applications, giving details and enclosing copies of 2 recent testimonials, should be sent to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. 2 HOUSE SURGEONS (pre-registration) required. Posts vacant January.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary as soon as possible.

HEMEL HEMPSTEAD. ST. PAUL'S AND WEST HERTS HOSPITALS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Clinical Pathology required at above Hospitals. Post now vacant. Hospitals may be visited by direct appointment.

Application form obtainable from and returnable to Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Hertfordshire.

HASTINGS. ST. HELEN'S HOSPITAL. (491 Beds.) HOUSE SURGEON required. Pre-registration post, recognised for F.R.C.S. Resident staff of 5. Vacant 10th December, 1958.

Apply to Hospital Administrator.

HEREFORD COUNTY HOSPITAL. (341 Beds.) House OFFICER (surgery) required immediately, pre-registration post. Hospital recognised for F.R.C.S. Married quarters are available.

Applications, with copies of 2 recent testimonials, to Medical Superintendent, County Hospital.

HEREFORD COUNTY HOSPITAL. (341 Beds.) House PHYSICIANS (medicine) required. Posts vacant 1st December and 15th December. Pre-registration posts.

Applications, with copies of 2 recent testimonials, to Medical Superintendent, County Hospital, Hereford.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general surgery, gynæcology and obstetrics) (first or second post). To commence 22nd December, 1958. Pre-registration post, recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HESWALL, WIRRAL, CHESHIRE. CLEAVER HOSPITAL. (220 Beds.) CENTRAL WIRRAL GROUP. Locum JUNIOR HOSPITAL MEDICAL OFFICER required for at least 3 months. Excellent facilities for obtaining good knowledge of modern treatment of pulmonary tuberculosis, including major surgery. Also non-tuberculosis and children's units.

Apply on forms from Secretary, Clatterbridge Hospital, Bebington, Wirral, Cheshire, immediately.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. RESIDENT HOUSE SURGEON post vacant 29th December.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Locum SENIOR HOUSE OFFICER in Anæsthetics required from 1st to 13th December.

Application, giving full particulars, to the Medical Administrator, Lister Hospital, Hitchin, or telephone Hitchin 3701.

HITCHIN. LISTER HOSPITAL. (305 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR required end of December at the above Hospital. Preference given to applicants having experience in medical emergencies. Post suitable for candidates for M.R.C.P. The Hospital may be visited by direct appointment (telephone : Hitchin 3701).

Application forms obtainable from the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, and returnable by 24th November.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN. Recognised pre-registration appointment for 6 months. Post vacant 10th December.

Applications, stating qualifications and age, together with copies of up to 3 recent testimonials, or names for reference, to the Hospital Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee,
The Royal Infirmary, Huddersfield.

KETTERING AND DISTRICT GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. The post, vacant now, offers wide experience of all traumatic conditions including fractures and some orthopædic cases, with charge of 30 Beds.

Applications, accompanied by testimonials, to be sent to the Group Secretary, General Hospital, Kettering.

KETTERING AND DISTRICT GENERAL HOSPITAL, NORTHAMPTONSHIRE. Applications are invited for the post of HOUSE SURGEON (pre-registration) which becomes vacant on 1st December, 1958. Post recognised for F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KETTERING GENERAL HOSPITAL, Kettering. (144 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Anæsthetics, vacant now. Post recognised for D.A.

Applications, giving details of qualifications and experience, and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering and District Hospital Management Committee, at the above address.

IPSWICH. FOXHALL HOSPITAL. (Actively engaged in the investigation and treatment of all forms of chest disease, including Respiratory Physiology Department and major surgery.) SENIOR HOUSE OFFICER required early November for duties mainly on non-tuberculous and surgical wards. Married quarters available.

Further particulars from Dr. G. R. MCNAB, Physician-Superintendent, to whom applications should be made.

IPSWICH. ST. HELEN'S HOSPITAL. (129 Beds for infectious diseases, pulmonary tuberculosis, long-stay orthopædics and geriatrics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea-road Wing), Ipswich.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for post of CASUALTY OFFICER (Senior House Officer grade), vacant 1st January, 1959. Post recognised for F.R.C.S. examinations.

Applications, stating age, nationality and experience, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for SENIOR HOUSE OFFICER to Fracture and Orthopædic Department. Post recognised for F.R.C.S. examinations. The Department has about 60 Beds and a large outpatient attendance, offering wide experience.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING). (280 Beds.) HOUSE SURGEON (pre-registration) to General Surgeons, required 23rd November.

Applications, with full details and copies of 3 recent testimonials, to Hospital Secretary.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Geriatrics

Hull A Group (328 geriatric beds in the charge of a Consultant Geriatrician). Duties include 3 sessions in general medicine. Non-resident.

Thoracic Surgery

Thoracic Surgery Units at the Bradford Royal Infirmary and the Middleton Hospital (aggregate of 61 Beds, both non-tuberculous and tuberculous cases). Non-resident.

Applications, stating age, qualifications, and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 26th November, 1958.

LEICESTER GENERAL HOSPITAL. (454 Beds. Recognised for training for M.R.C.O.G.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

LINCOLN. ST. GEORGE'S HOSPITAL. (242 Beds.) LINCOLN NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN at the above Hospital, vacant from 1st December. Duties include acute medical, acute chest, and pædiatrics.

Applications, giving full particulars and names for reference, should be addressed to the Secretary.

LIVERPOOL. WALTON HOSPITAL. (128 Beds.) Vacancies are available now for:—

SENIOR HOUSE OFFICERS in Regional Neurosurgical Unit. Recognised for F.R.C.S. diploma. Term of 1 year, renewable.

SENIOR HOUSE OFFICER in Orthopædics, also recognised for F.R.C.S. diploma.

Apply to Physician-Superintendent, giving names of 2 referees and details of age, nationality and qualifications.

LOUTH. COUNTY HOSPITAL. (215 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics and casualty) required. The appointment may include some duties in general surgery. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (surgical) required.

Apply, giving names and addresses of 2 referees, to the Hospital Secretary.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical), vacant now, at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LUTON, BEDFORDSHIRE. ST. MARY'S HOSPITAL. Whole-time Locum SENIOR HOUSE OFFICER required mid-November for 4–6 weeks.

Applications, giving full particulars, to the Secretary, St. Mary's Hospital, or telephone Luton 5790.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. Regional centre for severe burns and scalds and plastic surgery (unit of 45 Beds).

JUNIOR HOSPITAL MEDICAL OFFICER required for post vacant on 1st December. £170 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners, Male or Female, for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, vacant 1st February, 1959. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of the newborn in the Maternity Department, the care of infants in the infants' ward, and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scales.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned not later than 24th November, 1958.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for 12 months from 1st February, 1959. Previous hospital experience in general medicine and surgery and in obstetrics necessary. Recognised for M.R.C.O.G. examination. Duties involve clinical responsibility for mothers and babies and supervision of work of pre-registration House Officers. National scales.

Application forms from the undersigned, to be returned by 24th November, 1958. A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for 2 posts of HOUSE OFFICER in Obstetrics, normally but not necessarily for provisionally registered medical practitioners. Salary in accordance with national scales. The appointments are for 6 months from 1st February, 1959.

Application forms may be obtained from the undersigned and returned not later than 24th November, 1958.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The post is recognised for the purpose of the M.R.C.O.G. examination. The appointment is for 6 months starting 1st February, 1959. Salary in accordance with national scales.

Application forms may be obtained from the undersigned and returned not later than 24th November, 1958.

A. R. WISE, General Superintendent.

Saint Mary's Hospital, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of OBSTETRICAL HOUSE SURGEON to a maternity unit operating temporarily in the Whitworth Park Branch of the above-named Hospital, vacant 27th January, 1959. The post is supernumerary to the establishment recognised for training purposes by the Royal College of Obstetricians and Gynæcologists. Previous obstetrical experience is desirable. An opportunity exists for a limited amount of gynæcological training during tenure of the post. National scales.

Application forms, which may be obtained from the undersigned, to be returned no later than 30th November, 1958.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of REGISTRAR at the above Hospital (attached to the University Department of Ophthalmology). Whole-time post (non-resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staff will apply.

Applications to be made as soon as possible on forms obtainable from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR REGISTRAR in Diagnostic Radiology to commence as soon as possible. Whole-time non-resident appointment for 12 months, renewable. Duties will be divided between Manchester Royal Infirmary and Saint Mary's Hospitals for Women and Children, under the direction of the Consultant Radiologists. Applicants must possess the D.M.R.D. or its equivalent. Arrangements may eventually be made for the successful candidate to transfer to one of the Manchester Regional Hospitals to continue training.

Application form, obtainable from the undersigned, to be returned not later than 29th November, 1958.

A. B. SCOTT, Secretary to the Board of Governors.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædics) required at the above Hospital. This post offers excellent experience for persons who ultimately intend to specialise in orthopædic and accident work. In addition to the routine orthopædic duties of a general hospital, the unit carries out the reconstruction surgical programme of patients from the Devonshire Royal Hospital, Buxton, which has a regional catchment area.

Applications, with full details and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, as soon as possible.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 posts of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), one of which is now vacant and the second will be required in late January, 1959. Previous experience in pathology not essential, the posts affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER REGIONAL HOSPITAL BOARD. Royal INFIRMARY AND QUEEN'S PARK HOSPITAL, BLACKBURN. REGISTRAR, Department of Psychological Medicine. Post vacant mid-December, 1958. Opportunity for wide experience in the treatment of inpatients and outpatients in general hospitals (including psychiatric inpatients in general medical wards) under direction of Consultant Psychiatrist. Modern, self-contained flat available suitable for married man. Recognised for D.P.M. by Conjoint Board and Manchester University. Facilities for attending D.P.M. course, Manchester University, and studying for higher qualifications. Services of social worker and mental health workers.

Application forms from Group Secretary, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. FAIRFIELD AND ROSSENDALE GENERAL HOSPITALS. Applications are invited for the post of REGISTRAR in Obstetrics and Gynæcology. Post recognised for examinations of the D.Obst.R.C.O.G.

Apply, stating full details and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. Royal MANCHESTER CHILDREN'S HOSPITAL. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT SURGICAL OFFICER (Registrar grade) falling vacant 26th November, 1958. Previous experience in surgery essential. The Hospital is the chief teaching unit of the University Department of Child Health and the post gives ample opportunity for experience in all branches of surgery in children.

Applications to Group Secretary, Salford Royal Hospital, Salford, 3, before 22nd November, 1958.

MANCHESTER, 20. CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered practitioners for the post of ASSISTANT RESIDENT SURGICAL OFFICER (Senior House Officer grade). The post provides experience in the treatment of tumours and good opportunity for study.

Applications, with full details, including the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON, 6 months' appointment. Vacant 3rd January, 1959. Recognised for F.R.C.S. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (205 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required 23rd January. This post offers experience in general medicine and pædiatrics. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

MANSFIELD. HARLOW WOOD ORTHOPÆDIC HOSPITAL. (323 Beds. Recognised for the F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Duties include attendance at associated outpatient clinics and Hospital. Special experience in long-term training and traumatic surgery. Appointment for 1 year in first instance.

Apply to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT HOUSE PHYSICIAN (not pre-registration). Vacant 8th December.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to the Secretary at above address.

MUNDESLEY HOSPITAL, Norfolk (late The Mundesley Sanatorium). Applications are invited for the newly-created post of RESIDENT MEDICAL OFFICER (Senior House Officer status). This is a pioneer post-acute hospital and rehabilitation unit of 60 Beds, serving the whole of East Anglia, and is still in the process of development. The appointment offers unique experience in a wide range of medical and surgical convalescence, and is ideal for anyone as much interested in health and its manifestations as in disease processes. Salary £819 10s. p.a., in accordance with conditions of service issued by the Ministry of Health. Furnished house available in the grounds for a married man.

Hand-written applications, stating age, qualifications, experience, sex, and the names of 2 referees, should be addressed to the Secretary, Cromer Area Hospital Management Committee, Cliff-avenue, Cromer, Norfolk.

NEWPORT, I.W. ST. MARY'S HOSPITAL. Isle of WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (Senior House Officer grade, at £819 10s. p.a.) required 1st December. Post recognised for F.R.C.S.

Applications to Hospital Secretary immediately.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. Department of Neurological Surgery: Regional Unit. SENIOR HOUSE OFFICER. Post vacant end of November. Recognised for F.R.C.S.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of SENIOR REGISTRAR RADIOTHERAPIST, in the first year tenable at the Royal Victoria Infirmary. Candidates should hold a recognised Diploma in Radiotherapy or a higher qualification in medicine or surgery. The appointment is for 1 year in the first instance, and may be renewed to a maximum of 4 years. In any reappointment the successful candidate may be required to undertake duty in a hospital under the Newcastle Regional Hospital Board. The appointment will be subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details, and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time appointment of SENIOR HOUSE OFFICER in the Department of Anæsthetics at the Royal Victoria Infirmary which is associated with the Medical School of the University of Durham. The post will be for 1 year and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service. It will be non-resident except for rotational emergency duty and offers the opportunity for study for the F.F.A.R.C.S. Applicants should have held postgraduate appointments in medicine and surgery but previous experience in anæsthetics is not essential.

Applications, giving full details, and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required for above Hospital situated on Great North Road, approximately 20 miles from Nottingham. Post offers good experience. Consultant staff attending Newark Hospital are on one or more of the Nottingham Hospitals. Flat available as married quarters. Salary and conditions of service in accordance with Ministry regulations. Duties to commence immediately.

Applications, giving names of 3 referees, should be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NEWTON ABBOT HOSPITAL. Resident Senior House SURGEON, Male or Female, required immediately, to act as Casualty Officer and House Surgeon to special departments, together with relief duties. Ability to give outpatient anæsthetics advantageous. Married quarters available.

Applications (quoting reference F.364/41), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, South Devon.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (resident) required 19th January, 1959, for 1 year in the first instance at the North Herts Hospital, Hitchin (where he will reside), and the Lister Hospital, Hitchin. Post recognised for F.R.C.S. The Hospitals may be visited by direct appointment with the Medical Administrator, Lister Hospital.

Application forms obtainable from the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, and returnable by 1st December.

NORWICH. ST. ANDREW'S HOSPITAL, Thorpe, NORWICH. Applications are invited from registered medical practitioners (Male or Female) for the appointment of SENIOR HOUSE OFFICER (psychiatric). The Hospital has 1250 Beds, an admission-rate of over 750 annually, and affords comprehensive experience in psychiatry. The salary and conditions of service will be as laid down by the Ministry for Senior House Officers. Residential accommodation with board available.

Applications, stating age, qualifications and full particulars of experience, together with the names and addresses of 2 referees, to be sent as soon as possible to the Medical Superintendent.

NUNEATON. GEORGE ELIOT HOSPITAL. House OFFICER in General Surgery. Recognised pre-registration and F.R.C.S. Resident.

Applications to Hospital Secretary, George Eliot Hospital, Nuneaton.

NUNEATON. MANOR HOSPITAL. Senior House OFFICER in Anæsthetics. Resident or non-resident. Recognised D.A. and F.F.A. R.C.S.

Applications to Hospital Secretary.

NOTTINGHAM EYE HOSPITAL. (54 Beds. Recognised training hospital for D.O.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (ophthalmology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

NOTTINGHAM. GENERAL HOSPITAL. (452 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT ORTHOPÆDIC AND FRACTURE REGISTRAR required. The post offers exceptional experience in traumatic surgery. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

NOTTINGHAM GENERAL HOSPITAL. Pre-registration HOUSE SURGEON required. Duties to commence immediately.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (anæsthetics) required about 1st January, 1959. The post is recognised for the D.A. and the F.F.A. R.C.S. This is a busy general hospital, giving experience in all branches of surgery.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer). Previous experience an advantage. Post vacant 1st January, 1959.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (thoracic surgery) required immediately. Single accommodation available. Appointment for 1 year in first instance. Thoracic Unit at City Hospital undertakes non-tuberculous and cardiological cases; tuberculosis surgery undertaken at modern unit in nearby sanatorium, appointee encouraged to attend. Previous thoracic surgical experience desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN (Male or Female) for Geriatric Department. Post offers good clinical experience and opportunity for higher studies. Hospital may be visited by appointment.

Applications, with copies of 2 recent testimonials, to Surgeon-Superintendent immediately.

OXFORD REGIONAL HOSPITAL BOARD. Senior REGISTRAR in Psychiatry at St. Crispin Hospital, Duston, Northampton. Appointment for 1 year in the first instance, and, subject to satisfactory service, renewable for up to 4 years. It may be possible to arrange transfer to another mental hospital in the Oxford Region for the second half of the appointment. St. Crispin Hospital provides full training facilities, including Electroencephalography Department. Previous experience in child guidance work desirable. Applicants should hold the D.P.M. Accommodation, including 6-roomed house, available if required.

Applications, on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, should reach him by 6th December.

OXFORD. UNITED OXFORD HOSPITALS. Senior REGISTRAR in Dental Surgery to the Churchill Hospital and Radcliffe Infirmary. Post recognised for the F.D.S.

Application forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, should be returned to him by 25th November.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

HOUSE SURGEON, pre-registration post, vacant 1st December, 1958. Devonport Section.

HOUSE SURGEONS, pre-registration posts, vacancies, 2 on 1st January, 1959. Freedom Fields Section.

HOUSE SURGEONS, pre-registration posts, vacancies, 1 immediately, and 9th January, 1959. Greenbank-road Section.

All posts are recognised for the F.R.C.S.

Apply with names of 3 referees, also stating age, nationality, qualifications and experience to the Group Secretary, 7, Nelson-gardens, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road, PLYMOUTH. HOUSE PHYSICIANS, pre-registration posts, vacancies 1st and 14th January, 1959.

Apply with names of 3 referees, also stating age, nationality, qualifications and experience to the Group Secretary, 7, Nelson-gardens, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, FREEDOM FIELDS. Central Casualty Department. Resident Locum SENIOR HOUSE OFFICER in Casualty, vacant immediately. Recognised for the F.R.C.S.

Applications, with names of 3 referees, to be sent to the Group Secretary.

PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE. ANÆSTHETIST (Junior Hospital Medical Officer) required for duties at hospitals throughout the Group. Post resident or non-resident.

Applications, giving details of experience and the names and addresses of 2 referees, to the Group Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

PONTEFRACT GENERAL INFIRMARY. Resident CASUALTY OFFICER required immediately. Graded Senior House Officer. Recognised for Fellowship. Married accommodation available end of December, 1958.

Applications to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

PORTSMOUTH. INFECTIOUS DISEASES HOSPITAL. (308 Beds, including 126 infectious diseases and 88 tuberculosis.) PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in the above Hospital. The Hospital is a Poliomyelitis Diagnostic Unit, and the Respiratory Poliomyelitis Centre for the area is sited here.

Application forms, obtainable from the Group Secretary, Saint Mary's Hospital, Portsmouth, returnable by 24th November, 1958. Candidates may visit the Hospital by arrangement with the Group Secretary.

PORTSMOUTH. ROYAL PORTSMOUTH HOSPITAL. (104 orthopædic beds.) PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required in Orthopædic Department. Vacant now.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST, St. Mary's Hospital, Milton-road, Portsmouth.

PRESTON (near). WHITTINGHAM HOSPITAL MAN-AGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. All modern treatment is undertaken, including electroencephalography for the area. Facilities will be given for study either for the D.P.M. at Manchester University or for the M.R.C.P. at a large general hospital a few miles away. The Hospital is well situtated in a country district with easy access to Preston, Blackpool, and Southport. Flat available for a married man.

Applications to the Medical Superintendent, Whittingham Hospital, near Preston, Lancashire, to be received not later than Monday, 24th November, 1958.

PRESTON AND CHORLEY HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Pathology, with main duties in hæmatology and blood transfusion. This post is in the newly completed Group Laboratory at Preston Royal Infirmary.

Application forms obtainable from Group Secretary, Royal Infirmary, Preston, Lancashire.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department). Recognised for F.R.C.S. Duties include work in Area Casualty Department at Battle Hospital, Reading. Person appointed will work with Registrar and House Officer.

Apply, giving nationality, present post, and qualifications with dates, together with the names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the Department of Geriatric Medicine, which is being developed at Battle Hospital, Reading, under the charge of a Consultant Geriatric Physician.

Further particulars may be obtained from the Group Secretary, 3, Craven-road, Reading, to whom applications, stating age, qualifications, and names of 3 referees, should be addressed.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st December, 1958, for 6 months. Successful candidates required to carry out duties at the following Reading Hospitals: Royal Berkshire (397 Beds) and Prospect Park (104 Beds).

Write immediately, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (397 Beds.) Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE SURGEON, vacant 26th November and 1st December, 1958, and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (338 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the post of RESIDENT SENIOR HOUSE OFFICER (anæsthetics). Vacant immediately for a period of 1 year. Post recognised for F.F.A. R.C.S.

Write, stating age, qualifications with dates, nationality and present post, together with names of 3 referees, to Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.

St. James Hospital, Tredegar, Monmouthshire (38 general medicine, 43 chronic sick, and 43 obstetric beds). Married quarters.

OBSTETRIC HOUSE OFFICER (1st February).

Tredegar General Hospital (Surgical Unit of 50 Beds plus 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty, and Radiological Departments.) Married quarters.

HOUSE SURGEON (1st February) with opportunity to follow on to a House Physician or House Officer (obstetrics) if satisfactory.

Caerphilly District Hospital (acute general hospital, 226 Beds), 6 miles from Cardiff. Married quarters may be available. Vacancies on 1st February.

2 HOUSE SURGEONS, 1 with duties also in Orthopædic Department. Both recognised for F.R.C.S.

HOUSE PHYSICIAN.

Applications to the Group Secretary, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glamorgan.

RICHMOND, SURREY. ROYAL HOSPITAL. (121 Beds.) KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from experienced Medical Officers for the appointment of Full-time RESIDENT REGISTRAR (general surgery). Busy general hospital with full consultant staff. Single or married quarters are available.

Forms of application may be obtained from the Group Secretary (a foolscap stamped addressed envelope to be enclosed), and the completed forms should be returned to the Group Secretary, 35, Coombe-road, Kingston, as soon as possible.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (medicine) (Assistant Resident Medical Officer) required immediately at Birch Hill General Hospital. Resident staff includes Registrar (Resident Medical Officer), and 3 House Physicians.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHFORD GENERAL HOSPITAL. (620 Beds.) Appli-cations are invited for the appointment of SENIOR HOUSE OFFICER (surgery). Post recognised for F.R.C.S., and is resident. Vacant 1st December, 1958.

Applications, stating age, &c., to reach the Secretary by 20th November, 1958.

ROCHFORD GENERAL HOSPITAL. (620 Beds.) Locum REGISTRAR (resident) required in the Obstetric and Gynæcological Unit at the above Hospital for the period 1st-30th December, 1958.

Applications, &c., to the Secretary immediately.

ROCHFORD GENERAL HOSPITAL. (620 Beds.) Appli-cations required from pre-registration candidates for a 6-month appointment as HOUSE SURGEON (recognised for F.R.C.S.). Post vacant 1st December, 1958.

Applications, &c., (1 testimonial only necessary from pre-registration candidates seeking first appointment), to be sent to the Secretary by 26th November, 1958.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (2) required, 1 immediately and 1 on 3rd December next, in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully registered practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidates appointed will be attached to a unit of approximately 60 Beds.

Apply immediately to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

SALFORD. LADYWELL HOSPITAL. (Chest Unit, 110 Beds.) SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. The post is tenable for a maximum period of 4 years. Previous experience in the treatment of pulmonary tuberculosis is desirable but not essential. There is a visiting Thoracic Surgeon, and the surgery is undertaken at Baguley Hospital, Manchester, which is nearby.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be submitted immediately to the Hospital Secretary, Ladywell Hospital, Salford, 5, Lancs.

SALISBURY GENERAL HOSPITAL. Applications are invited for the combined appointment of HOUSE SURGEON in General Surgery and OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (recognised by R.C.O.G.) to run consecutively in this order for a period of 6 months in each post from 20th January, 1959. Vacancy for Locum HOUSE SURGEON available now until 20th January. Posts open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order for a period of 6 months in each post, from 1st January, 1959. Posts open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Orthopædic DEPARTMENT. Applications are invited for the post of SENIOR RESIDENT HOUSE SURGEON or RESIDENT HOUSE SURGEON. Appointment recognised for pre-registration candidates, and also Fellowship regulations. Department has over 50 Beds and large outpatient turnover, dealing with fractures and all types of orthopædic surgery.

Applications, stating age, nationality, qualifications and experience, and naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in E.N.T. Surgery based at the Southern General Hospital, Glasgow.

REGISTRAR in Psychiatry based at Bellsdyke Mental Hospital, Larbert, Stirlingshire.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 29th November, 1958.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance, and will become vacant during January, February, or March, 1959 :—

REGISTRAR in Anæsthetics based at the Glasgow Royal Infirmary and with rotational duties at the Royal Maternity Hospital and the Royal Hospital for Sick Children, Glasgow.

REGISTRAR in Anæsthetics based at the Dumfries and Galloway Royal Infirmary.

2 REGISTRARS in Laboratory Medicine based at the Glasgow Royal Infirmary.

REGISTRAR in Medicine based at the Western Infirmary, Glasgow.

REGISTRAR in Orthopædics based at the Western Infirmary, Glasgow, and with duties at Killearn Hospital.

REGISTRAR in Psychiatry based at Stobhill General Hospital, Glasgow.

REGISTRAR in Psychiatry based at Hawkhead Mental Hospital, Glasgow.

REGISTRAR in Surgery based at Stobhill General Hospital, Glasgow, and with duties on a rotational basis at Falkirk and District Royal Infirmary.

REGISTRAR in Surgery based at the Glasgow Royal Infirmary.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 29th November, 1958.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time non-resident post of SURGICAL REGISTRAR at the Inverness Hospitals.

Further particulars and application schedules can be obtained from the undersigned, with whom applications should be lodged by 6th December, 1958. A. M. FRASER,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Reay House, 17, Old Edinburgh-road, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time post of MEDICAL REGISTRAR at the Inverness Hospitals. Main duties are at Raigmore Hospital.

Schedules of application and further particulars are obtainable from the undersigned, to whom applications should be submitted by 22nd November, 1958.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Reay House, 17, Old Edinburgh-road, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER at the Ross Memorial Hospital, Dingwall. Applicants should have previous experience in obstetrics in hospital or general practice. The post is resident and a suitable house is available.

Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by 22nd November, 1958.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Reay House, 17, Old Edinburgh-road, Inverness.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Applications are invited for the resident post of Locum HOUSE SURGEON in General Surgery (Intern or Senior House Officer), for whole or part of period 14th November, 1958–14th January, 1959.

Apply, giving full details of experience and the names of 2 persons for reference, to the Group Secretary, Lyndhurst, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. CITY GENERAL HOSPITAL. (852 Beds. Recognised for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (thoracic surgery) required immediately. Appointment for 1 year in first instance. The Hospital has a Regional Department of Cardiology. Thoracic Surgical Unit deals with tuberculous and non-tuberculous cases. Previous thoracic surgical experience desirable.

Apply to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Department of Pathology, Area Laboratory. Applications are invited for the appointment of SENIOR HOUSE OFFICER (clinical pathology). Resident accommodation is available and optional. Opportunities for training in morbid anatomy, biochemistry, hæmatology, and bacteriology. The work of this and associated hospitals offers excellent experience to graduates who wish to make pathology their permanent career. The post is recognised for the D.Path.

Apply, giving details of age, qualifications, present and previous appointments, with dates, and the names of 2 persons to whom reference may be made, to the Group Secretary, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS BOARD OF GOVERNORS AND SHEFFIELD REGIONAL HOSPITAL BOARD. Reciprocal Training Scheme for Senior Registrars. Whole-time SENIOR REGISTRAR in E.N.T. Surgery required with initial tenure of appointment at the Royal Infirmary and Children's Hospital, Sheffield. Appointment for 1 year in the first instance and renewable annually thereafter. Successful candidate will be transferred to the Royal Infirmary, Leicester, for the second phase of the appointment, in accordance with the arrangements under the Reciprocal Training Scheme. Renewal of appointment and transfer will be subject to satisfactory work and progress.

Applications, with the names of 3 referees, to the Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1, not later than 18th November, 1958.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY. Applications are invited for the post of REGISTRAR or SENIOR HOUSE OFFICER in General Medicine at the above Hospital, where the successful applicant will work primarily in the Professorial Unit (therapeutics).

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 25th November, 1958, to Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts :—

(*a*) REGISTRAR or SENIOR HOUSE OFFICER at the Children's Hospital/Jessop Hospital, in association with the Department of Child Health in the University of Sheffield. Post is a rotating one between the 2 hospitals, and the successful candidate will spend part of his time in charge of the newborn babies at the Jessop Hospital, a period in the Professorial Department at the Children's Hospital, and a further period undertaking the medical care of surgical patients at the Children's Hospital. Post vacant 1st January, 1959.

Applications, with names of 3 referees, to be sent not later than 25th November, 1958, to Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

(*b*) SENIOR HOUSE OFFICER in Anæsthetics, Royal Infirmary. Post vacant now.

Applications, with names of 3 referees, to Superintendent, Royal Infirmary, Sheffield, 6.

SHREWSBURY. SHELTON MENTAL HOSPITAL. (1000 Beds.) SHREWSBURY HOSPITAL GROUP. JUNIOR HOSPITAL MEDICAL OFFICER. Appointment for 1-year in first instance. Single residential accommodation available. Recognised for D.P.M. Associated outpatient clinics.

Applications to Medical Superintendent.

SHREWSBURY. ROYAL SALOP INFIRMARY. (216 Beds.) 2 HOUSE SURGEONS. Vacant immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SENIOR HOUSE OFFICER (casualty) (1 of 2). Resident. Mornings 9 A.M. to 1 P.M., alternate afternoons with evenings and alternate weekends off duty. Post recognised for F.R.C.S. Vacant 14th November, 1958.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. Ortho-PÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months' training required for the Final Fellowship examination. Vacant immediately.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) HOUSE PHYSICIAN. Pre-registration candidates eligible. Vacant immediately.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) Senior House Officer to work as CLINICAL PATHOLOGIST to Group Laboratory. Appointment tenable for 1 year, resident or non-resident. Recognised for Diploma in Pathology. Vacant 1st January, 1959. A Unit of the Public Health Laboratory service is housed in the same building and there are facilities for training in all the 4 main branches of pathology.

Applications to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury, naming 3 referees.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SENIOR HOUSE OFFICER (E.N.T.) Duties at E.N.T. Hospital (68 Beds) and Copthorne Hospital (168 Beds). Post recognised for the D.L.O. and F.R.C.S. Vacant 29th November, 1958.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOS-PITAL. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN/HOUSE SURGEON to run consecutively for a period of 6 months in each post. Posts approved for pre- or post-registration practitioners and F.R.C.S.

Applications to Hospital Secretary, Southlands Hospital, Shoreham-by-Sea. A. V. OAKTON, Group Secretary, Worthing Group Hospital Management Committee.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOS-PITAL. (411 Beds.) HOUSE PHYSICIANS. Posts vacant 1st and 19th January.

Applications to Hospital Secretary.
A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOS-PITAL. (411 Beds.) HOUSE SURGEON. Post recognised by R.C.S. for Fellowship; entails duties in general surgery and orthopædics; vacant 1st January.

Applications to Secretary, Southlands Hospital.
A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

SHOTTS, LANARKSHIRE. HARTWOOD MENTAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital of 1910 Beds. The appointment is subject to the National Health Service salary scale and conditions.

Applications, with full details, should be sent to the Physician-Superintendent.

SOUTHAMPTON CHEST HOSPITAL. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL REGISTRAR (resident or non-resident) to the Cardiac Department at above Hospital. Duties to include the investigation of patients by means of modern techniques. Previous experience in cardiology not essential. The Cardiac and Thoracic Departments (72 Beds) are closely linked, and the care of postoperative cardiac patients will be part of the Registrar's duties.

Application forms may be obtained from the undersigned, to whom they should be returned not later than 26th November, 1958. FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (465 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required end of November. Pre-registration candidate eligible.

Applications should be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, with copies of recent testimonials.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the Canterbury and Isle of Thanet Groups of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 29th November, 1958.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 surgical teams. (Post recognised for F.R.C.S.) Post vacant 9th December, 1958, and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required for duties mainly in the Pædiatric Department. Preference given to candidates seeking pre-registration post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ASAPH HOSPITAL, St. Asaph, Flintshire. Appoint-ment of HOUSE OFFICER. Duties divided between ophthalmology (16 Beds), E.N.T. (12 Beds), and oral surgery (4 Beds).

Applications, stating age, qualifications and experience, accompanied by 2 recent testimonials, to be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Locum E.N.T. REGISTRAR required for the period 2nd–16th December, 1958, inclusive.

Applications, stating age, qualifications and previous experience, should be sent to the undersigned as soon as possible.
J. C. FIELD, Secretary.

STOCKPORT AND BUXTON HOSPITAL MANAGE-MENT COMMITTEE. HOUSE OFFICER (ophthalmology and general surgery) required, with duties at Stepping Hill Hospital, Stockport, and Outpatient Clinics at Stockport Infirmary. Recognised for the D.O.M.S.

Applications, with full particulars, and copies of 2 testimonials, to the Group Secretary, 59B, Shaw Heath, Stockport.

STOCKPORT INFIRMARY. Stockport and Buxton HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (non-resident Casualty Officer). Hours of duty: 8.30 A.M.–4.30 P.M. Monday–Friday; 8.30 A.M.–12 SOON Saturday. The post is recognised under F.R.C.S. regulations and would suit a candidate wishing to study for higher qualifications. It is vacant 15th December, 1958.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport, Cheshire.

STOCKPORT INFIRMARY. (163 Beds.) Applications are invited for the post of HOUSE OFFICER (general surgery). This is an approved pre-registration post and is recognised for the F.R.C.S.

Applications, with copies of 2 testimonials, to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. Applica-tions are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgery). Vacant 29th November, 1958. The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for the pre-registration post of HOUSE OFFICER (surgery).

Applications, with full particulars and copies of 2 testimonials, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pædiatrics). The post, which may be either resident or non-resident, becomes vacant on 1st December, 1958.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post vacant very shortly. Some duties also at Hartshill Orthopædic Hospital.

Detailed applications, with copy testimonials, to Hospital Secretary.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICERS (general surgery) required. Pre-registration. 2 posts vacant early January. Recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Hospital Secretary, North Staffordshire Royal Infirmary, Stoke-on-Trent.

SUTTON AND CHEAM HOSPITAL, Cotswold-road, SUTTON, SURREY. RESIDENT SENIOR HOUSE OFFICER (Casualty Officer). Post recognised for F.R.C.S. Vacant now.

Applications, stating age, qualifications and experience, with copies of recent testimonials and the names of 2 referees, to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT HOUSE PHYSICIAN in acute medical unit of 64 Beds at St. Margaret's Hospital. Recognised for training under pre-registration internship regulations.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT HOUSE SURGEON for general surgical unit of 80 Beds at Victoria Hospital, Swindon. Recognised for F.R.C.S. and training under pre-registration internship regulations. Married accommodation is available.

Full details, giving names of 3 referees, to Secretary, 7, Okus-road, Swindon.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. Locum HOUSE PHYSICIAN required for approximately 2 months.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. SENIOR HOUSE OFFICER (anæsthetics) required. Post, vacant early December, is recognised for F.F.A. R.C.S. and D.A. A Registrar in Anæsthetics is also employed in the South Somerset Clinical Area, in which the above is the principal General Hospital.

Applications, stating age, nationality, experience in anæsthetics (if any), together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton.

TILBURY AND RIVERSIDE GENERAL HOSPITAL. ORSETT BRANCH, ORSETT, ESSEX. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE PHYSICIAN with paediatric and other duties at the above Hospital. The post, which becomes vacant early in December, is for 6 months in the first instance, and is recognised for the D.C.H.

Applications, together with copies of recent testimonials, should be forwarded to the undersigned.

G. E. WHYTE, Group Secretary,
Tilbury and South East Essex
Hospital Management Committee.

Thurrock Hospital, Grays, Essex.

TORQUAY. TORBAY HOSPITAL. (180 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required for last week of November. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic, and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting reference F.955/91), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. Senior Resident HOUSE OFFICER (medicine) required end November, 1958. There is a complement of 7 Resident House Officers.

Applications, stating qualifications, age, nationality, with copy testimonials (quoting reference F. 955/90) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY. (357 staffed available beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (obstetrics and gynæcology). Applications invited for this appointment, which is a combined appointment of 1 year in obstetrics gynæcology, recognised for M.R.C.O.G. Vacant 1st December, 1958. There are 66 obstetric beds and 20 gynæcological beds. Applicants must have held a previous obstetric post.

Apply, stating age, qualifications and experience, with 2 recent testimonials, by 16th November, 1958, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. REGIONAL THORACIC CENTRE. Applications invited for positions of SENIOR HOUSE PHYSICIAN and SENIOR HOUSE SURGEON. Salary £819 10s. p.a. £150 p.a. charged for accommodation.

Address written applications, giving full personal particulars, details of experience, and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. REGIONAL THORACIC CENTRE. Applications invited for position of JUNIOR HOSPITAL MEDICAL OFFICER. Salary scale £852 10s.–£55–£1182 10s. p.a. £170 p.a. charged for accommodation.

Address written applications, giving full personal particulars, details of experience and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WARWICK (near). KING EDWARD VII MEMORIAL CHEST HOSPITAL, HERTFORD HILL, near WARWICK. (Diseases of the chest—228 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER, resident. The Hospital is a modern one with a thoracic surgical unit.

Applications, with names and addresses of 3 referees, to Medical Superintendent.

WATFORD PEACE MEMORIAL HOSPITAL, Watford, HERTFORDSHIRE. (211 Beds.) CASUALTY OFFICER (Senior House Officer) required. Modern department employing 4 full-time Casualty Officers, including whole-time Surgeon-in-charge. Post recognised for F.R.C.S. Resident or non-resident. Post vacant 11th December.

Please send applications, with copies of 2 recent testimonials, to the Administrator.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required, resident. New appointment. Duties mainly at 2 general hospitals. Recognised for D.A. and F.F.A. R.C.S. The post is tenable for 1 year.

Applications, with names of 3 referees, to be sent to the undersigned. J. O. ROBINS, Group Secretary.
West Bromwich and District General Hospital,
Edward street, West Bromwich.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) Applications are invited from duly qualified medical practitioners for the pre-registration appointment of HOUSE PHYSICIAN. Single residential accommodation provided. Vacant January, 1959.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WEYMOUTH AND DISTRICT HOSPITAL. (124 Beds.) HOUSE PHYSICIAN (Male or Female) required for resident, pre-registration post now vacant and tenable for 6 months.

Applications, stating age, experience and qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR in Thoracic Medicine, Llangwyfan Hospital, near Denbigh. Modern methods of treatment of tuberculosis and chest diseases. 370 adult beds (Male and Female) and children. Hospital also contains major thoracic unit.

REGISTRAR in Plastic Surgery, Sr. Lawrence Hospital, Chepstow (182 Beds.) Expected to visit other hospitals in South Wales area. Considerable opportunities for training in specialty. Accommodation for single person.

REGISTRAR (paediatrics), based Merthyr General Hospital, Merthyr, to serve Merthyr and Aberdare Hospital Management Committee. Married quarters may be available.

REGISTRAR in General Surgery, Maelor General and War Memorial Hospitals, Wrexham. Hospital recognised for F.R.C.S. Resident/non-resident.

REGISTRAR (general medicine), Caernarvon and Anglesey General Hospital, Bangor (130 Beds), further extension opening shortly. Non-resident. Vacant 18th February, 1959.

REGISTRAR (obstetrics and gynæcology), Neath General Hospital, Neath (412 Beds). Hospital recognised for M.R.C.O.G. Resident/non-resident. Vacant 7th May, 1959.

REGISTRAR (general surgery), St. Woolos Hospital, Newport, Mon. (379 Beds). Post covers 56 Beds, recognised F.R.C.S. 6 months. Non-resident. Vacant 5th April, 1959.

REGISTRAR (infectious diseases), based Hill House Isolation Hospital, Swansea (130 Beds), to serve Glantawe Hospital Management Committee. Resident. Vacant 1st May, 1959.

REGISTRAR (general medicine), Maelor General Hospital and War Memorial Hospital, Wrexham. Resident/non-resident. Vacant 1st March, 1959.

REGISTRAR (general surgery), East Glamorgan Hospital, Church Village, near Pontypridd (336 Beds) with large out-patient Department. Committee's base hospital serving 174,000 population. Also expected to serve other hospitals within Group. Hospital recognised for F.R.C.S.

Subject to review end of first year.

Applications forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens REGISTRAR in Anæsthetics required Caerphilly Hospital, near Cardiff, immediately.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE PHYSICIAN required for the Walsall General (Sister Dora) Hospital.

Apply Group Secretary.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. LEIGH INFIRMARY, LEIGH. SENIOR HOUSE OFFICER required for Casualty Department, with gynæcological and surgical duties at Astley Hospital.

Apply Secretary, Knowsley House, Wigan.

WIGAN (near). WRIGHTINGTON HOSPITAL. Locum REGISTRAR required. The post offers experience in long-term orthopædic surgery.

Apply to the Secretary, giving the names of 2 referees.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (324 Beds.) HOUSE SURGEON (post recognised by the Royal College of Surgeons) required for General Surgery with some E.N.T. duties. Approved pre-registration post. Vacant 1st December.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (324 Beds.) HOUSE PHYSICIAN (pre-registration). Vacant 1st January.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (324 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience under area orthopædic team. Appointment for 6 months in first instance. Vacant 13th December, 1958.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (324 Beds.) HOUSE OFFICER (anæsthetics). Post vacant 1st January, 1959. The Hospital is recognised for the F.F.A. R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Registrar (Casualty Officer), resident or non-resident, required immediately. There is an Accident Unit of 30 Beds at the Hospital and, with the Casualty Department, forms part of the Accident Service for the Windsor Group, and includes duties with the E.N.T. and Eye Departments. Candidates should have had previous experience in the treatment of acute injuries.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Almaroad, Windsor.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 29th November. Recognised for F.R.C.S. Pre-registration post.

Applications, stating age, nationality, qualifications, and copies of recent testimonials, to Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. Senior HOUSE OFFICER for Thoracic Surgery and Casualty. Post recognised for F.R.C.S. Vacant immediately.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS (general surgery). Posts recognised for F.R.C.S. Vacancies occurring immediately and on 1st and 8th January.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) SENIOR HOUSE OFFICER (anaesthetics). Post vacant 20th January. Recognised for D.A. and F.F.A. R.C.S.

Apply, with copies of 2 testimonials, to the Secretary.

WORKINGTON INFIRMARY, Cumberland. (174 Beds, pre-registration post, recognised F.R.C.S.(Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post). Vacant beginning of November.

Detailed applications, with dates and names of 2 referees, to Group Secretary.

WORKSOP. VICTORIAL HOSPITAL. (119 Beds—26 orthopædic beds. Recognised for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (orthopædics and casualty) required 23rd December. Furnished married accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th November, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR or SENIOR REGISTRAR in Anæsthetics based at hospitals managed by the South Belfast Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 6th December, 1958.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN, CANADA. Applications are invited for JUNIOR ROTATING INTERNESHIP appointments in an 800-Bed general hospital, commencing 1st July, 1959. All services very active. Salary $125 per month with full maintenance, with bonus of $25 per month payable for satisfactory service.

Applications should be sent to Mr. C. E. BARTON, Acting Superintendent.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1- or 2-year approved GENERAL PRACTICE RESIDENCY in modern 234-Bed general hospital 10 miles from Detroit. Excellent facilities. Hospital approved for Exchange-Visitor programme. Beginning monthly salary $250 if single, $300 if married. Free housing.

Apply: Director.

ST. JOHN'S, NEWFOUNDLAND, CANADA. GENERAL HOSPITAL. (456 Beds.) The above Hospital has vacancies for INTERNES, for which applications are invited. Salary $2500 p.a. less $528 for maintenance. There is a full teaching programme, the Hospital is fully approved by the Canadian Medical Association for Interne training, approved by the Royal College of Physicians and Surgeons in Canada for postgraduate training towards certification and also recognised under the United Kingdom Medical Act for pre-registration year. Transport to St. John's will be provided and on completion of 1 year's service, return fare to the United Kingdom will be provided.

Applications, with full details as to age, &c., together with names of 2 referees, should be forwarded to Dr. E. WILSON, Superintendent, General Hospital, St. John's, Newfoundland, Canada.

Public Appointments

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. SENIOR ASSISTANT MEDICAL OFFICERS in (*a*) Area 9 (Brentford and Chiswick, Heston and Isleworth, Southall), (*b*) Area 3 (Hornsey and Tottenham). Whole-time for administrative and clinical work. Approval by Minister of Education for ascertainment of educationally subnormal children desirable. Diploma in Public Health essential. Salary £1370–£50(3)–£55(4)–£1740 p.a. Established subject to medical assessment and prescribed conditions.

Apply, giving full particulars and names of 2 referees, to Area Medical Officer at: (*a*) 92, Bath-road, Hounslow, (*b*) Local County Offices, Somerset-road, Tottenham, N.17, by 29th November. Canvassing disqualifies.

NOTTINGHAM. CITY OF NOTTINGHAM HEALTH SERVICES. SENIOR ASSISTANT MEDICAL OFFICER. Applications are invited for this appointment from registered medical practitioners holding the Diploma of Public Health. Salary will be within the scale £1150–£1575 p.a.; commencing salary will be fixed in accordance with experience. The successful candidate will be given opportunities for administrative and practical experience in all services of the Health Department. The appointment is superannuable and subject to the usual conditions.

Forms of application may be obtained from the Medical Officer of Health, Huntingdon-street, Nottingham, to whom they must be returned, together with the names of 2 referees, by not later than 28th November, 1958. T. J. OWEN, Town Clerk.

Guildhall, Nottingham. October, 1958.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

BRIGHTON. COUNTY BOROUGH OF BRIGHTON. HEALTH DEPARTMENT. Applications invited from registered medical practitioners (either sex) for the whole-time appointment of SENIOR ASSISTANT MEDICAL OFFICER OF HEALTH. Salary £1605–£105–£1710.

Applicants must hold the D.P.H. and should:—

(1) Have had 2 years' experience in obstetric and child welfare work.

(2) Have been approved by the Ministry of Education for the ascertainment of educationally subnormal children.

Application forms and conditions of appointment from the Medical Officer of Health, Royal York Buildings, Brighton, 1.

Town Hall, Brighton, 1. W. O. DODD, Town Clerk.

HALIFAX. COUNTY BOROUGH OF HALIFAX. Assis-TANT MEDICAL OFFICER (Male or Female). Applications are invited for this appointment in the Health Department. Salary £1050–£1475.

Full particulars are available from the undersigned. Closing date for applications, 26th November, 1958.

Town Hall, Halifax. RICHARD DE Z. HALL, Town Clerk.

ST. HELENS. COUNTY BOROUGH OF ST. HELENS. HEALTH DEPARTMENT. Applications are invited from qualified medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH (Male or Female) at a salary of £1050 p.a. rising by annual increments to £1475 p.a. Recognition may be given to past local authority service in fixing the commencing salary. The possession of D.P.H. or D.C.H. is desirable, but not essential. Consideration for housing accommodation will be given according to the circumstances of the successful candidate.

Application forms and further particulars of appointment may be obtained from the undersigned.

G. O'BRIEN, Medical Officer of Health.

Town Hall, St. Helens, Lancs, November, 1958.

STAFFORDSHIRE COUNTY COUNCIL. Health Depart-MENT. Appointment of COUNTY PSYCHIATRIST. Applications are invited from registered medical practitioners with suitable experience to undertake duties involving the day-to-day control of the Mental Health Section of the Department, including mental deficiency and lunacy, together with child guidance arrangements of the School Health Service. Practical experience of child guidance work is desirable and the possession of a Diploma in Psychological Medicine will be considered an advantage. The candidate will be on the staff of the County Medical Officer of Health, to whom he will be responsible. The salary scale will be in accordance with the latest Industrial Court award, i.e., £1520 p.a., rising by annual increments of £50 (1) and £55 (7) to £1955 p.a., and previous similar service may be taken into consideration when deciding the commencing rate. The candidate appointed will be required to provide a car and will be paid allowances in accordance with the County Council's scale. The appointment, which will be terminable by 3 months' notice in writing on either side, will also be subject to the provisions of the appropriate Superannuation Acts and Regulations, in which connection the successful candidate will be required to pass a medical examination and produce his or her birth certificate.

Applications, stating age, qualifications and experience, together with copies of not more than 3 recent testimonials, should reach the County Medical Officer of Health, County Buildings, Stafford, not later than 1st December, 1958. Canvassing, directly or indirectly, will disqualify, and all applicants must state whether, to their knowledge, they are related to any member or senior officer of the County Council.

T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford. 5th November, 1958.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT. Applications are invited from registered medical practitioners, holding in addition a Degree in Sanitary Science, Public Health, or State Medicine, for the post of DEPUTY MEDICAL OFFICER OF HEALTH for the City of Stoke-on-Trent at an annual salary of £1700 rising to a maximum of £1965 plus car allowance. Applicants should have had considerable experience both in the clinical and administrative aspects of a Health Department. Consideration will be given to housing accommodation on a service tenancy if required. The appointment is full-time, superannuable, subject to medical examination and terminable by 3 months' notice on either side.

Applications, with full particulars and the names of 3 persons to whom reference can be made, should be addressed to the Medical Officer of Health, St. Peter's Chambers, Glebe-street, Stoke-on-Trent, not later than 27th November, 1958. Canvassing, directly or indirectly will be a disqualification.

HARRY TAYLOR, Town Clerk.

SURREY COUNTY COUNCIL. Mixed appointment of Surrey County DEPUTY DIVISIONAL MEDICAL OFFICER and MEDICAL OFFICER OF HEALTH for Esher and Malden and Coombe (separate appointments). Applications invited from fully qualified registered medical practitioners for these appointments; superannuable and subject to medical examination and Sanitary Officers (outside London) Regulations, 1935–51. Salary within scale £1776 7s. 3d.–£2140 13s. 7d. according to experience. Essential car user allowance.

Applications, giving age, qualifications, experience, and the names of 3 referees, to County Clerk, County Hall, Kingston-upon-Thames, by 21st November, 1958. Canvassing disqualifies.

W. W. RUFF, Clerk of Surrey County Council.
F. EDWARDS, Clerk of Esher Urban District Council.
H. E. BARRETT, Town Clerk of Malden and Coombe.

MANCHESTER EDUCATION COMMITTEE. Deputy SENIOR MEDICAL OFFICER required for work in the School Health Service. Salary £1290–£50–£1440–£55–£1605 p.a. The duties will include administration and the ascertainment of handicapped pupils. Previous experience in a health service is essential. D.P.H. or D.C.H. desirable.

Application forms and particulars (stamped addressed envelope) from Chief Education Officer, P.O. Box 480, Manchester, 3, returnable to the Town Clerk, Town Hall, Manchester, 2, by 25th November, 1958. Envelope to be endorsed "School Health Medical Officer".

MANCHESTER EDUCATION COMMITTEE. School MEDICAL OFFICER (Male) required for work in the School Health Service. Salary £1050–£1475 p.a. Preference given to candidates with experience in children's diseases and retinoscopy and holding D.P.H. or D.C.H.

Application forms and particulars (stamped addressed envelope) from Chief Education Officer, P.O. Box 480, Manchester 3, returnable to the Town Clerk, Town Hall, Manchester 2, by 28th November, 1958. Envelope to be endorsed "School Health Medical Officer".

SOUTH EASTERN GAS BOARD

ASSISTANT MEDICAL OFFICER (part-time).

Applications are invited for the post of Assistant Medical Officer at Brighton. The appointment carries an annual salary on the British Medical Association scale for part-time Industrial Medical Officers. The gentleman appointed will be responsible to the Chief Medical Officer for carrying out industrial medical work in the centre named. Interest in occupational medicine is essential and some experience of occupational medicine would be an advantage.

The work will entail 6 hours per week and may also include responsibility for Eastbourne if this can be conveniently arranged.

Further particulars of the post may be had from the Personnel Manager, South Eastern Gas Board, Katharine-street, Croydon, to whom applications, quoting Reference V 119/991, should be sent by 15th December.

GOVERNMENT OF JAMAICA. Applications invited for the following posts:—

(*a*) BACTERIOLOGIST AND PATHOLOGIST to be in charge of and responsible for organisation and administration of Government Bacteriological Laboratory and to supervise Laboratory Service throughout Jamaica. Will also be required to organise and effect training of Medical Officers and Technicians (Laboratory Assistants) in their duties in bacteriology and pathology and advise Chief Medical Officer on matters associated with this branch of the medical services. Other duties in the specialty as assigned by Chief Medical Officer.

(*b*) ASSISTANT BACTERIOLOGIST for duties assigned to him by Government Bacteriologist and Pathologist, including work of a consultative nature in respect of pathology (including morbid anatomy) in rural areas and in rural laboratories.

Candidates must possess qualifications registrable in United Kingdom and for (*a*) have had at least 10 years' experience in pathology and/or bacteriology and approved experience in medical laboratory administration. 3 years' approved experience in pathology required for (*b*). Higher qualification in pathology or bacteriology an asset. Salary, without right to retain fees for consulting practice, £2300 a year for (*a*) and £2200 a year for (*b*), or with right to retain fees for consulting practice £2000 for (*a*) and £1900 for (*b*). Appointments on contract for 3 years with gratuity (taxable) of 20 % of salary for each 3 months' service, payable on satisfactory completion of service. Free passages for officer, wife, and dependent children under 18 years, not exceeding 5 persons in all. Government quarters not available but subsidy payable where rent exceeds 10 % of salary. Income-tax at local rates. Climate healthy. Educational facilities available.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/32/07).

GOVERNMENT OF THE FEDERATION OF NIGERIA. MALARIOLOGIST required to carry out malaria surveys in the field, organise and supervise chemotherapeutic trials, and train junior technical staff. The Federal Malaria Service has well-established reputation, its research scope is wide and full of interest. Possession of D.P.H. or D.T.M. and H. an asset.

Appointment:—

(*a*) On short-term contract with inclusive salary from £1338 to £2286 a year, or from £1536 to £2286 for officer possessing D.P.H. On completion of contract a gratuity is paid of £37 10s. for each completed period of 3 months' service (including leave).

(*b*) From National Health Service with inclusive salary from £1128 to £1950 a year, or from £1326 to £1950 for officer possessing D.P.H., candidate retaining superannuation rights and receiving gratuity (taxable) of 20 % of aggregate of salary.

Starting salary assessed according to length of postgraduate experience.

Quarters at low rental. Free return passages for officer and wife. Officer can claim actual amount expended in any 1 tour (up to cost of 2 adult return passages) for children under 18 to join him in Nigeria, or for wife to visit them in home country. Children's (separate domicile) allowance of £75 a year for each child under 18, ceasing if children join parents in Nigeria. Income-tax at local rates. Local leave permissible and generous home leave after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/14/056).

GOVERNMENT OF THE FEDERATION OF RHODESIA AND NYASALAND. Vacancies: MEDICAL OFFICERS OF HEALTH. Applicants must hold a Diploma in Public Health, and experience in schools medical work will be an advantage. Duties will also include environmental hygiene in rural areas and the prevention of endemic and epidemic diseases. Commencing salary: £1775 p.a. on the scale £1775–£75–£2000–£50–£2950 p.a. There are 4 senior posts in the public-health field with salary at the rate of £2750 p.a. (fixed), and Medical Officers of Health are also considered with other Medical Officers for promotion to suitable posts in other fields.

Full particulars and application forms from the Secretary (R), Rhodesia House, 429, Strand, London, W.C.2. Closing date 13th December.

GLOUCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER (Male). Must be registered medical practitioner. Possession of a Diploma or Certificate in Public Health an advantage. Salary £1050–£1475 p.a. Superannuable. Medical examination. Car driver and should possess a motorcar.

Application forms obtainable from County Medical Officer of Health, Berkeley House, Berkeley-street, Gloucester, returnable by 29th November, 1958.

GUY H. DAVIS, Clerk of the County Council.

Miscellaneous

Bayer Products Limited require a young, registered Medical Practitioner to assist in their medical department. Applicants should have a fluent knowledge of French and if possible some other European languages. The post offers considerable scope and the duties will include assisting with clinical trials and other matters in the U.K., and the successful applicant will be working in the medical department at Kingston.—Applications in confidence to the Personnel Officer, Bayer Products Limited, Neville House, Eden-street, Kingston-on-Thames, Surrey.

Evans Medical Supplies Ltd. require the services of a Male graduate Bacteriologist at The Evans Biological Institute, Runcorn, Cheshire. The man appointed will take part in the routine bacteriological work connected with the production of sera, vaccines, and other biological products. An opportunity for original investigation in this specialised scientific field will be provided. Previous experience of large-scale bacteriological production methods although desirable is not essential. The commencing salary will be related to academic qualifications and past experience.

Applications to the Medical Director, The Evans Biological Institute, Runcorn, Cheshire.

MSL have been retained to advise on the appointment of the

CHIEF MEDICAL ADVISER
TO
THE WELLCOME FOUNDATION LIMITED

The Chief Medical Adviser will be responsible to the Research Director for planning and directing the work of the Medical Research Department.

He will be required, with the assistance of his team of medically qualified staff, to arrange clinical investigations and evaluate the results, and to provide authoritative medical advice on established, new and prospective products. Collaboration with the company's sales divisions, as well as with its research laboratories, will be involved. He will also maintain close liaison with the medical departments of overseas subsidiary companies.

The status of the appointment is such that candidates must have had wide and varied clinical experience and be at least 40 years of age: a higher qualification would be an advantage. They should also have had sustained contact with the pharmaceutical industry, either by conducting clinical trials in collaboration with pharmaceutical firms or by holding an appointment within the industry.

No information will be disclosed to our clients until candidates have given permission after a personal and confidential discussion. Please send details of qualifications, experience and publications, in confidence, quoting reference AN.1262, to R. A. Denerley.

MANAGEMENT SELECTION LIMITED
17, Stratton Street, London, W.1

New York City. Leading child guidance agency has opening for Psychiatrist to direct new project in testing and developing child guidance techniques. 25–35 hours per week; analytic training and experience in treatment of children required. Approximate salary will be made available. Address inquiries: Address No. 435, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Partnership offered, after preliminary Assistantship, Surrey village, 15 miles from London, to commence New Year. List 4000, plus half private. Appointments, including staff of G.P. hospitals. Salary £1000, plus car allowance. Young Male, Protestant, Scot, public school, Edinburgh graduate preferred.—Address No. 443, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Consulting Physician seeks from 1st March, 1959, share in Consulting-rooms (W.1). From noon until 4 P.M. Tuesdays and Fridays. Reception and cleaning service essential and facilities for screening and secretary preferred.—Address, No. 442, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 153, Victoria-street, S.W.1 (VIC. 0141), who are specialists.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

The British Journal of Medical Hypnotism. Quarterly, £2 2s. p.a.—Orders to the publishers, 4, Victoria-terrace, Hove, 3, Sussex.

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what is a TONIC?

NEARLY EVERY PHYSICIAN prescribing a tonic today thinks first in terms of either iron or vitamins. Or both; because the efficacy of iron depends so much on the vitamins linked with its absorption.

Foremost of these are ascorbic acid and the factors of the vitamin B complex.

All these are presented with easily assimilable ferrous iron in a single tablet of Ferraplex B.

Ferraplex B tablets are easily swallowed and well tolerated. They provide a complete iron haematinic therapy for convalescents, adolescents, pregnant women and patients with all degrees of iron deficiency anaemia.

COMPOSITION

Average daily dose of six FERRAPLEX B *tablets contains:*

Ferri Sulph. Exsicc., B.P.	1 gramme
Copper Carbonate	2 mg.
Ascorbic Acid (Vitamin C)	50 mg.
NATURAL VITAMIN B COMPLEX EXTRACT	2 grammes

prepared from brewers' yeast and including

Aneurine hydrochloride (Vitamin B_1)	3 mg.
Riboflavine (Vitamin B_2)	6 mg.
Nicotinamide	30 mg.

and all the other naturally occurring factors of the vitamin B complex.

FERRAPLEX B

COMPLETE, ACCEPTABLE

IRON HAEMATINIC

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DURABOLIN

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the most powerful tissue-builder

One 25 mg. injection weekly